

Allianz Global Corporate & Specialty

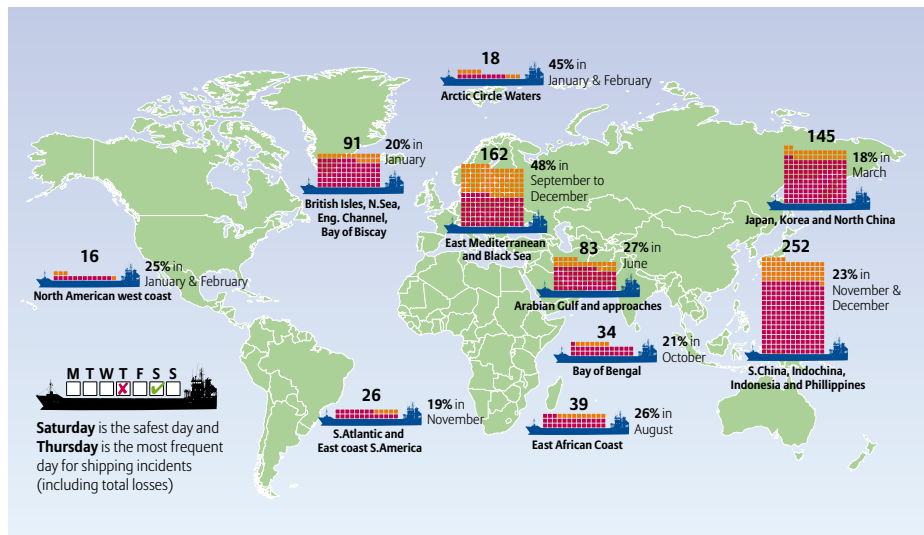
Safety and Shipping Review 2016

An annual review of trends and developments
in shipping losses and safety



Höegh Osaka aground on Bramble Bank, UK, January 2015
Photo: Geni, Wikimedia Commons, GFDL CC-BY-SA

Allianz 



Thursday is the most frequent day for shipping incidents
 Image: Allianz Global Corporate & Specialty



Underwater photo of the wreckage of the El Faro
 Photo: National Transportation Safety Board



The 106-year-old **Grossherzogin Elisabeth** was one of the oldest ships to be involved in an incident during 2015
 Photo: Wikimedia Commons

Executive Summary

International shipping transports approximately 80% of global trade by volume and over 70% of global trade by value¹. The safety of vessels is critical to the global economy. The maritime industry saw the number of total losses remain stable during 2015, declining slightly to **85**; the lowest total for a decade and the second year in a row annual losses fell below 100.

Losses declined 3% compared with 2014 (**88**). The 2015 accident year represents a significant improvement on the 10-year loss average (**123**). Large shipping losses have declined by **45%** over the past decade, driven by an increasingly robust safety environment and self-regulation. However, regional disparities remain.

More than a quarter of all losses in 2015 (**22**) occurred in the **South China, Indochina, Indonesia and Philippines** maritime region, which has been the top loss hotspot for the past decade. Losses are up year-on-year and are double those of the next highest loss region, **East Mediterranean and Black Sea (11)**.

Cargo (36) and **fishing (16)** vessels accounted for over 60% of ships lost with cargo losses increasing for the first time in three years. **Foundered (sunk/submerged)** is the most common cause of loss, often driven by bad weather, accounting for almost **75% (63)**, up **25%** year-on-year.

In total, there were **2,687** reported shipping casualties (*incidents*) during 2015, down **4%** year-on-year. The **East Mediterranean and Black Sea region (484)** remains the global hotspot. Together, with the **British**

Isles, N. Sea, Eng. Channel, Bay of Biscay, it accounts for a third of all incidents over the past decade. Thursday is the most frequent day for shipping incidents with Saturday the safest.

Economic pressures impact: While the long-term downward trend in shipping losses is encouraging, the continuing weak global economy, depressed commodity prices and an excess of ships are pressurizing costs and raising safety concerns. **Machinery damage (36%)** is already the most common cause of shipping incidents and preventative measures is often one of the first shipboard expenses to suffer. AGCS has observed an increase in frequency losses over the past 12 months, which, for some classes, can likely be attributed to some extent to the economic environment.

As well as impacting investment in **vessel maintenance and repair, crewing conditions and training**, cost pressures can also impair **passenger ship safety, salvage and rescue and safe cargo carrying**.

It's critical that economic pressures do not allow a **"put it off until later"** safety mentality to develop. Some shipowners are already stretching maintenance to the longest possible intervals, while others are considering laying-up vessels or are already doing so. Vessels which are laid-up for a period of time can return to a market that has moved on technologically. There is a need for standardized layup procedures. Without these, the reactivation of such vessels may result in a **"painful"** exercise for the industry.



This review focuses on key developments in maritime safety and analyzes shipping losses (of over 100 gross tons) during the 12 months prior to December 31, 2015. It follows the **Safety and Shipping Review 2015** by Allianz Global Corporate & Specialty (AGCS) available at www.agcs.allianz.com

Seafarer shortage, fatigue and training issues: There has been an increase in fatigue-related insurance claims over the past decade. With crew numbers often at their lowest possible level, and with the industry anticipating a future staffing shortage, expectations are for longer shift patterns, which could exacerbate the issue. Meanwhile, training remains below par in some areas, such as with **electronic navigational aids**, which should not be seen as a panacea but as a tool.

Passenger ship safety: Significant concerns remain, particularly around non-international voyages. Some Asian routes are many years behind recognized international standards, as evidenced by a number of recent ferry losses in South East Asian waters. Frequent sailings and profit pressures mean scheduling necessary maintenance can prove challenging.

“Mega ship” salvage challenges: The appetite for ever-larger container ships has seen cargo-carrying capacity of the largest vessels increase by over **70%** over the past decade, to carry 19,000+ containers today. Two “mega ships” were grounded in February 2016, raising safety concerns about what could happen should a more serious incident occur. The industry may need to prepare for a \$1bn+ loss in future. There are concerns that commercial pressures in the salvage business have reduced easy access to the salvors required for recovery work on this scale.

Superstorm ship sinkings: Meteorological predictions anticipate more extreme weather conditions, bringing additional safety risks for shipping and potential disruption to supply chains. Hurricanes and bad weather were contributing factors in at least three of the five largest vessels lost during 2015 including **El Faro**, the worst US commercial maritime disaster in decades. It is also a major factor in South China, Indochina, Indonesia and Philippines being the global loss hotspot. Weather routing will continue to be a critical component to the safe navigation of vessels.

Lower emissions safety threat: The shipping industry has been proactively working to reduce emissions, but there have been unexpected safety implications connected with the use of ultra-low sulfur fuel. Engine problems and power issues have been reported and such incidents could increase as regulations on sulfur content in fuel tighten further. Generally, AGCS has seen an increase in machinery claims in relation to fuel.

Arctic casualties increase: There were **71** reported shipping incidents in **Arctic Circle waters** during 2015, **up 29% year-on-year** and the highest in a decade. In 2006 there were just **8** incidents. Machinery damage/failure (**46**) was the cause of **65%** of incidents, driven by the harsh environment. The mandatory Polar Code, expected to enter into force in 2017, will help ensure more responsible shipping in such high-risk waters but safety questions remain.

The cyber threat grows: The maritime industry’s reliance on interconnected systems poses risks as well as bringing benefits. Threats can result from improper integration and interaction of cyber systems/updates or attacks from external sources and are not always detected. More needs to be done to educate companies. While the likelihood of a cyber event that cuts off a significant portion of trade remains low at present, cyber exposure is growing. Technological advances such as **“The Internet of Things”**, allied with increasing reliance on e-navigation, means insurers may have less than five years to prepare for a cyber-attack or incident materializing into a hull and machinery lossⁱⁱ.

Piracy evolves as potential cyber risk: There was an increase in the number of piracy attacks (**246**)ⁱⁱⁱ during 2015. Progress continues in Africa with incidents down in Nigeria and Somalia, although the risk remains high. Attacks in **South East Asia** continue to increase, with the region accounting for **60%** of global incidents and Vietnam a new hotspot. There are also indications pirates may be abusing holes in cyber security to target specific cargoes. There have already been a number of notable marine-related cyber incidents. The industry needs more robust cyber technology in order to monitor the movement of stolen cargoes.

Other rising concerns include: **Supply chain and accumulation risk** in the wake of the **Tianjin explosion** in China in 2015; **Cargo risk**, particularly around accurate weighing of containers and shifting cargo (**liquefaction**) - technological support is needed to test the moisture content of cargoes which can liquefy; **Car carrier stability** – in the aftermath of the **Höegh Osaka** grounding incident; **Geopolitical instability** – in addition to the physical risks, there are operational risks due to unexpected port closures and vessel delays; **The return of Iran** to the global shipping stage after easing of sanctions raises safety questions about vessel and port standards in Iranian waters.

85
losses

in 2015

29
yearsAverage age of vessels
lost in 2015

#1

Market developments
is the top risk identified
by the marine sector for
2016*

*Allianz Risk Barometer

i UNCTAD

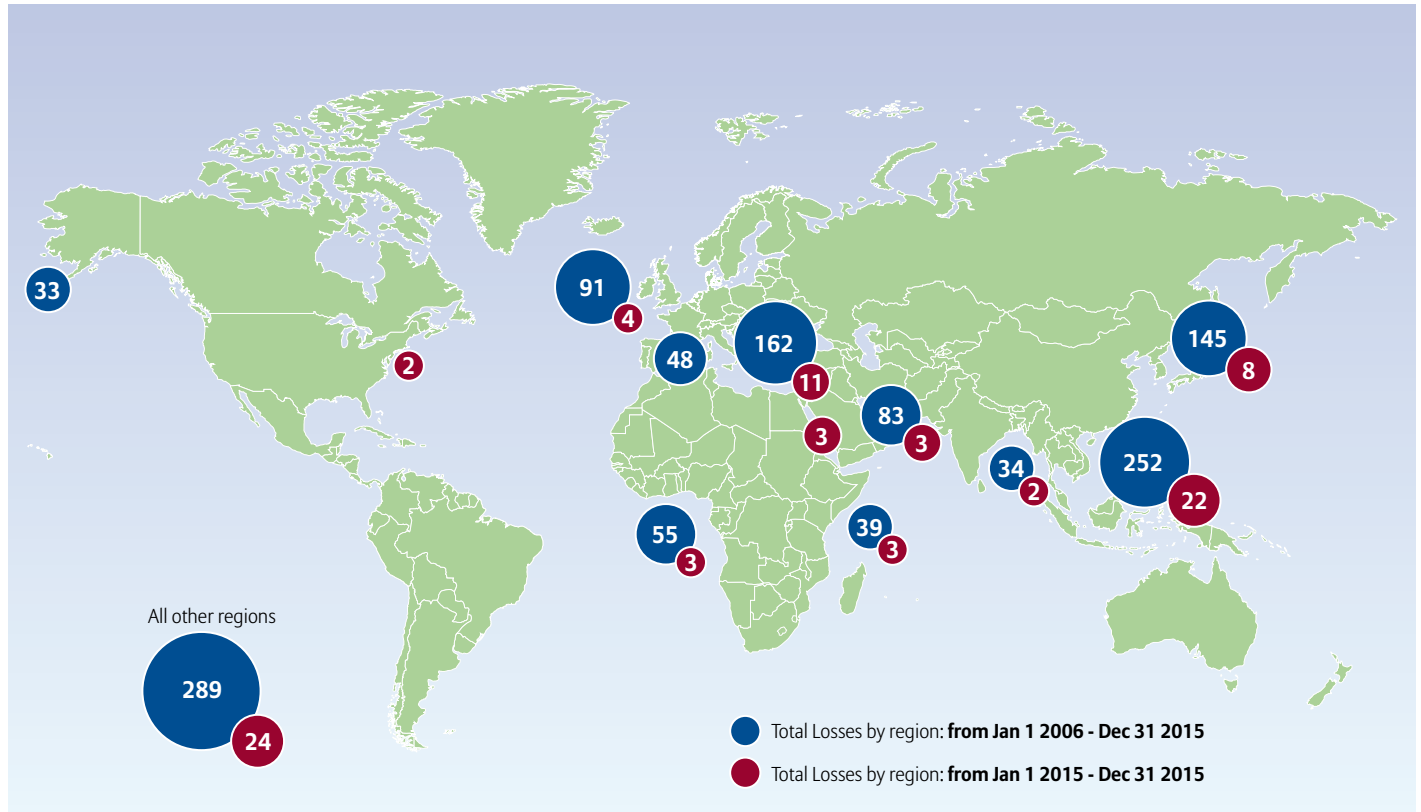
ii Joint Hull Committee Cyber Risk Information Paper http://www.lmalloyds.com/LMA/News/whats_hot/JHC_Cyber_Info_Paper.aspx

iii International Maritime Bureau.

2015: Losses in Focus

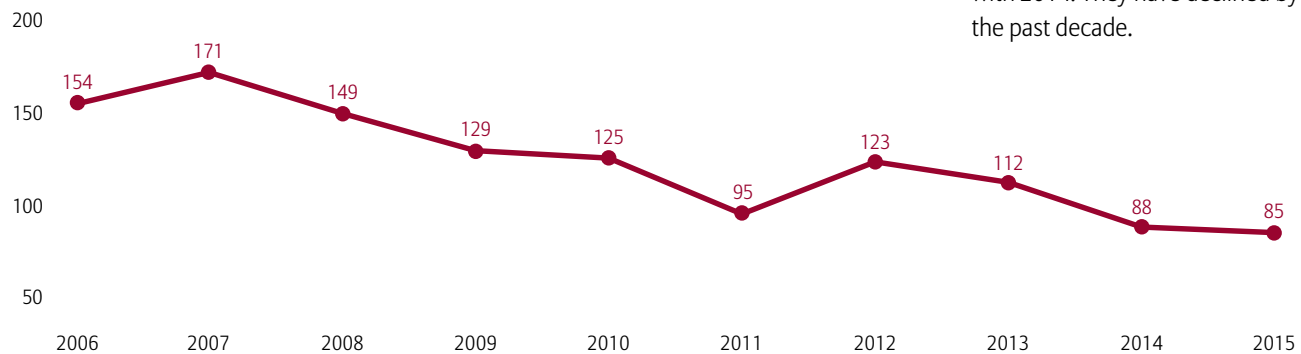
The analysis over the following pages covers both total losses and casualties/incidents.
See page 38 for further details.

Total Losses by Top 10 Regions: 2006-2015 and 2015



Source: Lloyd's List Intelligence Casualty Statistics. Data Analysis & Graphic: Allianz Global Corporate & Specialty

Total Losses by Year a declining trend

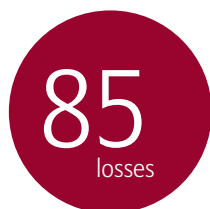


Shipping losses declined by 3% compared with 2014. They have declined by 45% over the past decade.

Source: Lloyd's List Intelligence Casualty Statistics. Data Analysis & Graphic: Allianz Global Corporate & Specialty

Total Losses by Top 10 regions: from January 1, 2015 to December 31, 2015

2015: Total losses declined 3% year-on-year from 88 to 85 - the lowest for a decade. More than a quarter of all losses occurred in the South China, Indochina, Indonesia and Philippines region (22, up three losses year-on-year). Total losses in the East Mediterranean and Black Sea and Japan, Korea and North China regions declined year-on-year (see page 12).



The lowest total for a decade

S. China, Indochina, Indonesia and Philippines	22
East Mediterranean and Black Sea	11
Japan, Korea and North China	8
British Isles, N. Sea, Eng. Channel, Bay of Biscay	4
Arabian Gulf and approaches	3
East African Coast	3
Red Sea	3
West African Coast	3
Bay of Bengal	2
US Eastern Seaboard	2
Others	24
Total Losses by Region	85

For year-on-year analysis see [page 12](#)

Source: Lloyd's List Intelligence Casualty Statistics.
Data Analysis & Graphic: Allianz Global Corporate & Specialty

Total Losses by Top 10 regions: from January 1, 2006 to December 31, 2015

2006 - 2015: 1,231 losses worldwide were identified over this period. The 2015 accident year (85) represents a significant improvement on the 10-year loss average (123). South China, Indochina, Indonesia and Philippines has been the top hotspot (252) for a decade, followed by East Mediterranean and Black Sea (162) and Japan, Korea and North China (145).

5 key shipping regions contain **60%** of losses



S. China, Indochina, Indonesia and Philippines	252
East Mediterranean and Black Sea	162
Japan, Korea and North China	145
British Isles, N. Sea, Eng. Channel, Bay of Biscay	91
Arabian Gulf and approaches	83
West African Coast	55
West Mediterranean	48
East African Coast	39
Bay of Bengal	34
Russian Arctic and Bering Sea	33
Others	289
Total Losses by Region	1,231

Source: Lloyd's List Intelligence Casualty Statistics.
Data Analysis & Graphic: Allianz Global Corporate & Specialty

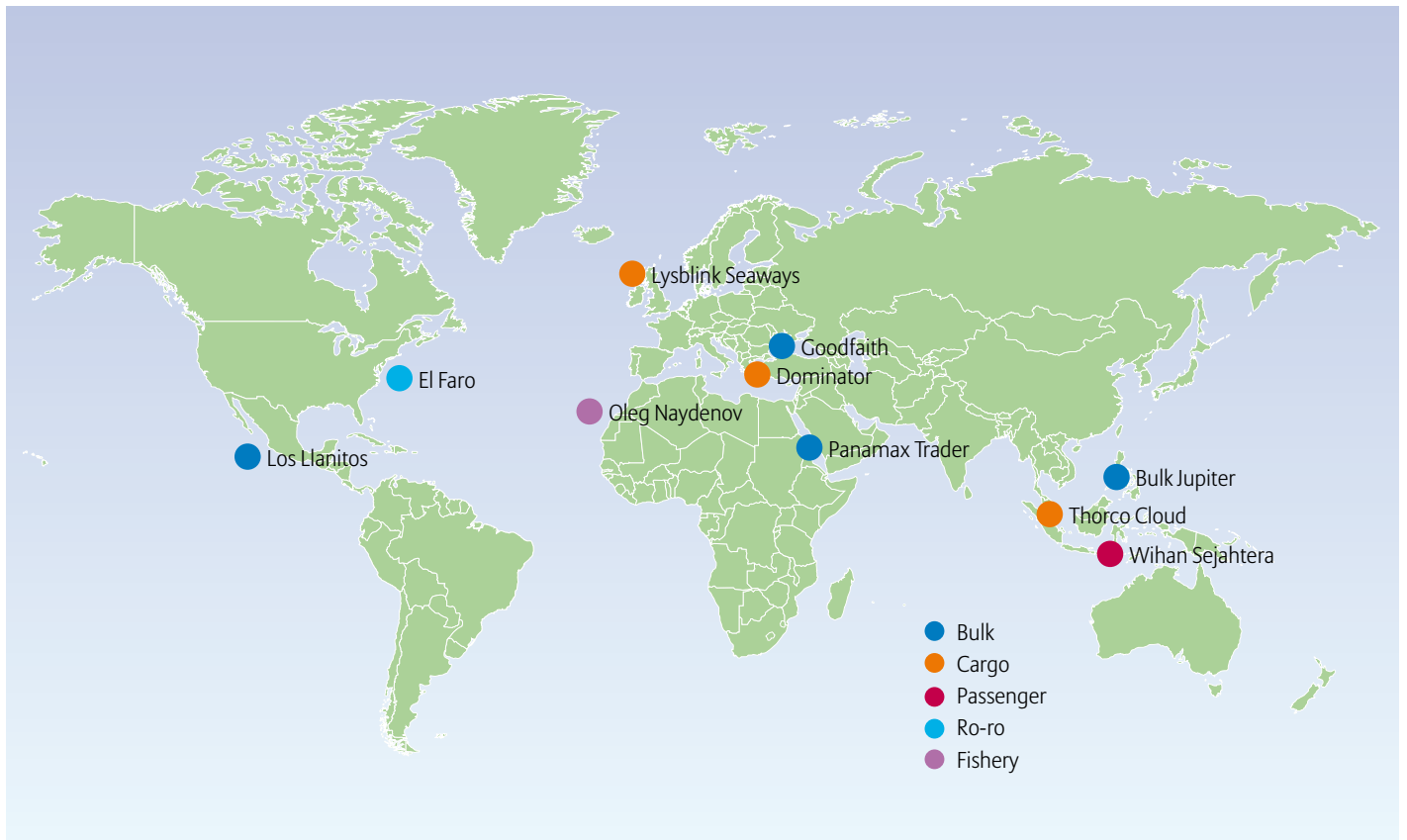
All figures based on reported losses as of January 22, 2016. 2015 total losses may increase slightly, as based on previous years' experience developments in losses lead to a number of total losses being confirmed after year-end. The average variance over the past nine years has been an increase of less than three total losses, but in some years this varies, with up to 13 additional losses being notified for one year.

Major Losses: 2015

Largest ships lost

10 largest vessels lost from January 1, 2015 to December 31, 2015

(showing approximate location of loss and type of vessel)



Source: Lloyd's List Intelligence Casualty Statistics. Data Analysis & Graphic: Allianz Global Corporate & Specialty

Largest vessels

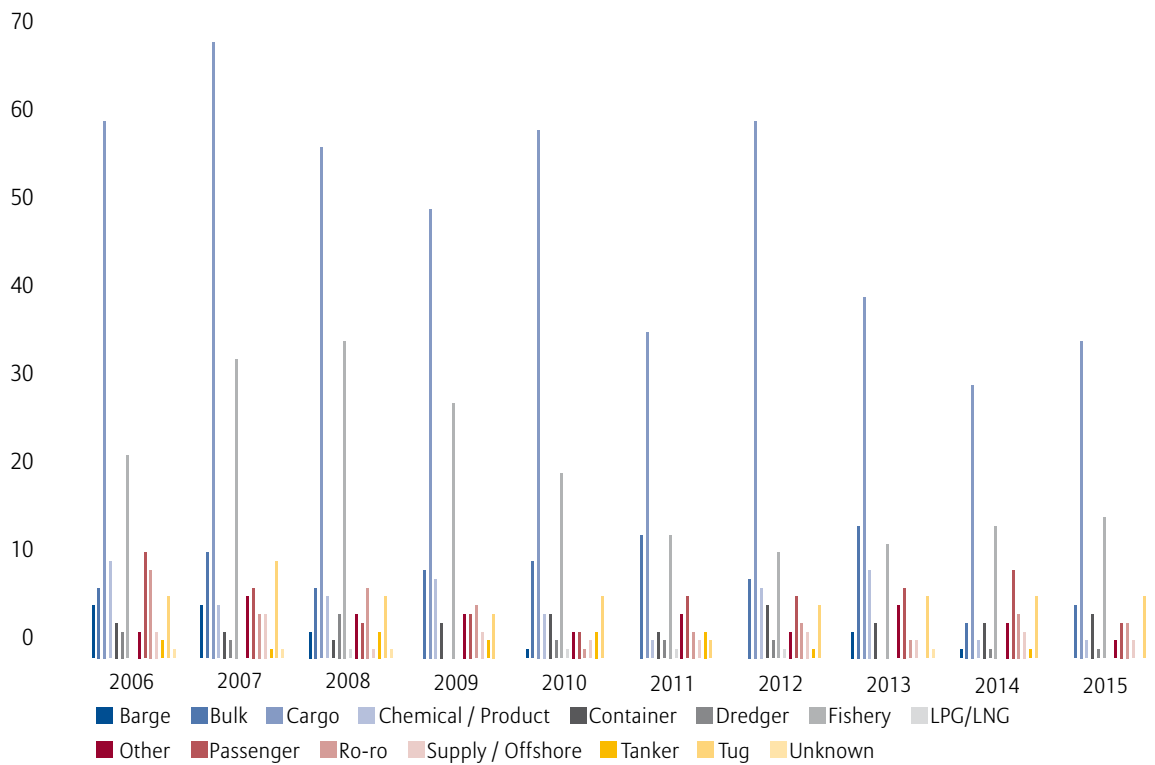
<p>● Los Llanitos 24 October 2015. Ran aground due to Hurricane Patricia. Sustained severe hull damage. No fatalities. 38,105 GT</p>	<p>● Wihan Sejahtera 16 November 2015. Sank. Passengers rescued before vessel capsized. 9,786 GT</p>
<p>● Panamax Trader 8 March 2015. Sank due to water ingress while en-route for repairs following grounding. No fatalities. 35,890 GT</p>	<p>● Dominator 16 April 2015. Water ingress due to crack in hull. Crew evacuated. 9,641 GT</p>
<p>● El Faro 2 October 2015. Lost propulsion and sank due to Hurricane Joaquin. 33 crew members lost. 31,515 GT</p>	<p>● Thorco Cloud 16 December 2015. Sank after collision with chemical tanker Stolt Commitment. 3 of 6 crew rescued. 7,813 GT</p>
<p>● Bulk Jupiter 2 January 2015. Sank. 18 fatalities. 31,256 GT</p>	<p>● Oleg Naydenov 11 April 2015. Fire in the boiler room. Crew evacuated. 7,765 GT</p>
<p>● Goodfaith 10 February 2015. Grounded in bad weather. Wreck removed. Crew evacuated. 16,446 GT</p>	<p>● Lysblink Seaways 18 February 2015. Grounded. Towed to breakers. 7,409 GT</p>

Two hurricanes and bad weather were contributing factors in at least three of the five largest vessels lost during 2015. Bulk carrier **Los Llanitos** ran aground off the Mexican coast due to Hurricane Patricia, while extreme weather conditions due to Hurricane Joaquin have been put forward as the cause of the sinking of the **El Faro** off the Bahamas, which resulted in the loss of all crew. Meanwhile, gale strength winds led to the bulk carrier **Goodfaith** running aground in the Aegean Sea along the coast of Andros Island, Greece.

Foundered is the most common cause of loss among the 10 largest vessels, accounting for half of those lost. **Wrecked/stranded (grounded)** accounted for three vessels, while **fire/explosion** and **hull damage** caused the loss of one vessel each respectively.

“More extreme weather conditions have been predicted. Weather routing will continue to be a critical component to the safe navigation of vessels”

Total losses by type of vessel 2006-2015



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Cargo	61	70	58	51	60	37	61	41	31	36	506
Fishery	23	34	36	29	21	14	12	13	15	16	213
Bulk	8	12	8	10	11	14	9	15	4	6	97
Passenger	12	8	4	5	3	7	7	8	10	4	68
Tug	7	11	7	5	7	2	6	7	7	7	66
Chemical/Product	11	6	7	9	5	2	8	10	2	2	62
Ro-ro	10	5	8	6	1	3	4	2	5	4	48
Other	3	7	5	5	3	5	3	6	4	2	43
Container	4	3	2	4	5	3	6	4	4	5	40
Supply/Offshore	3	5	1	3	2	2	3	2	3	2	26
Barge	6	6	3		1			3	1		20
Dredger	3	2	5		2	2	2		1	1	18
Tanker	2	1	3	2	3	3	1		1		16
LPG/LNP			1		1	1	1				4
Unknown	1	1	1					1			4
Total	154	171	149	129	125	95	123	112	88	85	1,231

Source: Lloyd's List Intelligence Casualty Statistics. Data Analysis & Graphic: Allianz Global Corporate & Specialty

2015 is the second year in a row that annual losses have dropped below 100 and the third time this has occurred in the past five years, driven in part by an increasingly robust safety environment.

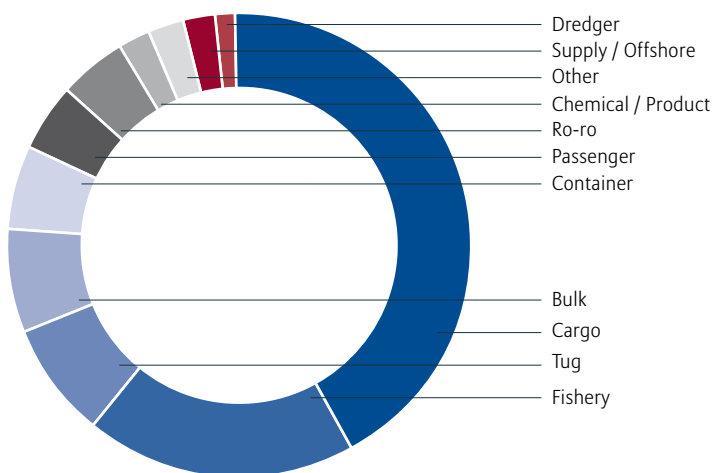
Together, cargo (506) and fishing vessels (213) have accounted for almost 60% of the 1,231 losses over the past decade. Bulk carrier ranks third (97). Cargo has topped the loss rankings every year for the past decade.



Underwater shot of the El Faro, one of four reported ro-ros lost during 2015
 Photo: National Transportation Safety Board

Total Losses by type of vessel

January 1, 2015 - December 31, 2015



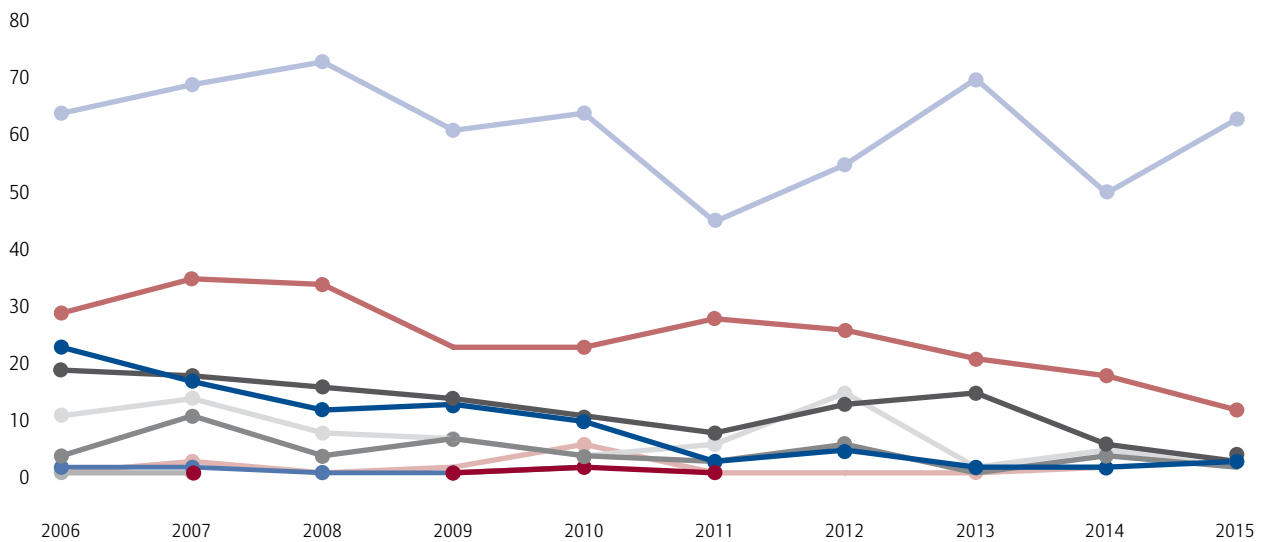
Cargo	36
Fishery	16
Tug	7
Bulk	6
Container	5
Passenger	4
Ro-ro	4
Chemical / Product	2
Other	2
Supply / Offshore	2
Dredger	1
Total	85

Source: Lloyd's List Intelligence Casualty Statistics.
 Data Analysis & Graphic: Allianz Global Corporate & Specialty

Cargo and fishing vessels also accounted for over 60% of ships lost during 2015, with both types of vessels seeing a reported increase in losses year-on-year. This is the first time there has been an increase in cargo losses for three years, a potentially concerning development.

Although fishing vessels have seen a reduction in losses over the past five years, compared with 2006-2010, they remain significantly exposed due to harsh operating environments and time pressures around catching/quotas.

Causes of Total Losses 2006-2015



Foundered (sunk or submerged) accounts for half (614) of all reported shipping losses over the past decade. One in five losses are related to vessels being wrecked/stranded (grounded). However, the number of such incidents has halved in the past five years. There were no total losses resulting from a piracy incident for the fourth successive year.

- Collision (involving vessels)
- Contact (e.g. harbor wall)
- Foundered (sunk, submerged)
- Fire/explosion
- Hull damage (holed, cracks, etc.)
- Missing/overdue
- Machinery damage/failure
- Piracy
- Wrecked/stranded (aground)
- Miscellaneous

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Grand Total
Foundered (sunk, submerged)	64	69	73	61	64	45	55	70	50	63	614
Wrecked/stranded (grounded)	29	35	34	23	23	28	26	21	18	12	249
Fire/explosion	19	18	16	14	11	8	13	15	6	3	123
Collision (involving vessels)	23	17	12	13	10	3	5	2	2	3	90
Machinery damage/failure	11	14	8	7	4	6	15	2	5	2	74
Hull damage (holed, cracks, etc.)	4	11	4	7	4	3	6	1	4	2	46
Miscellaneous	1	3	1	2	6	1	1	1	2		18
Contact (e.g. harbor wall)	2	2	1	1			2		1		9
Piracy		1		1	2	1					5
Missing/overdue	1	1			1						3
Grand Total	154	171	149	129	125	95	123	112	88	85	1,231

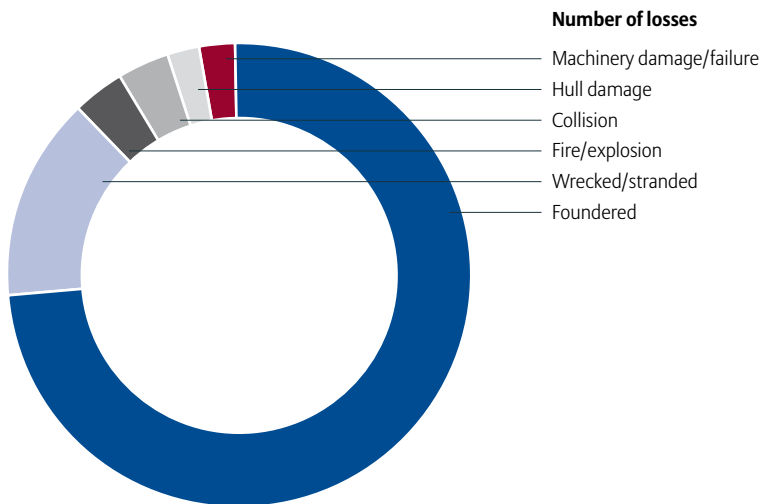
Source: Lloyd's List Intelligence Casualty Statistics. Data Analysis & Graphic: Allianz Global Corporate & Specialty

Causes of Total Losses

January 1, 2015 - December 31, 2015

For every year over the past decade foundered has been the most common cause of loss for large ships. In 2015 it was the cause of almost 75% of total losses, often driven by bad weather, its highest proportion of all losses over the past decade. Such incidents were up 25% year-on-year. There were significant reductions in the number of wreckings/strandings and fires/explosions year-on-year.

Foundered	63
Wrecked/stranded	12
Collision	3
Fire/explosion	3
Hull damage	2
Machinery damage/failure	2
Total	85



Source: Lloyd's List Intelligence Casualty Statistics.
 Data Analysis & Graphic: Allianz Global Corporate & Specialty

2015 Total Losses in all regions

Total losses by regions: 2006-2015; 2015 and 2014 comparison

The **South China, Indochina, Indonesia and Philippines** and **Red Sea** regions saw the largest increase in total losses year-on-year (up 3). The **Japan, Korea and North China** region saw losses decline for the second successive year (down 4).

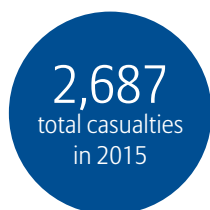
	Total losses 2006-2015	Total losses 2015	Total losses 2014	Year-on-year Change
S. China, Indochina and Indonesia and Philippines	252	22	19	↑ 3
East Mediterranean and Black Sea	162	11	12	↓ 1
Japan, Korea and North China	145	8	12	↓ 4
British Isles, N. Sea, Eng. Channel, Bay of Biscay	91	4	7	↓ 3
Arabian Gulf and approaches	83	3	4	↓ 1
West African Coast	55	3	2	↑ 1
West Mediterranean	48		2	↓ 2
East African Coast	39	3	1	↑ 2
Bay of Bengal	34	2	3	↓ 1
Russian Arctic and Bering Sea	33	2	2	
Baltic	32	2		↑ 2
West Indies	31	1	3	↓ 2
S. Atlantic and East Coast S. America	26	2	3	↓ 1
Iceland and Northern Norway	25	2	3	↓ 1
South Pacific	18	2	3	↓ 1
Gulf of Mexico	18	2	1	↑ 1
North Atlantic	18	2	2	
North American West Coast	16	2		↑ 2
United States Eastern Seaboard	15	2	1	↑ 1
Canadian Arctic and Alaska	13	1		↑ 1
South American West Coast	13	2	3	↓ 1
Australasia	12	1		↑ 1
Red Sea	11	3		↑ 3
Newfoundland	11	1	2	↓ 1
Indian Ocean	5	1	1	
Great Lakes	5		1	↓ 1
North Pacific	4	1		↑ 1
Cape Horn	4		1	↓ 1
Not recorded (unknown location)	4			
Suez Canal	4			
Panama Canal	2			
South Pole	1			
Kiel Canal	1			
Grand Total	1,231	85	88	↓ 3

There were 2 losses in the **Russian Arctic and Bering Sea** region during 2015 and 1 in the **Canadian Arctic and Alaska** region.

Source: Lloyd's List Intelligence Casualty Statistics. Data Analysis & Graphic: Allianz Global Corporate & Specialty

All Casualties including Total Losses - Top 10 regions: 2015

2015: The East Mediterranean and Black Sea region has been the location of the most shipping casualties (incidents) for the past four years in a row. Machinery damage (973) is the most common cause of shipping incidents around the globe, accounting for 36% of casualties. Wrecked/stranded ranks second (359) with collision (348) third.



Down 4% year-on-year



Caused by machinery
damage

East Mediterranean and Black Sea	484
British Isles, N. Sea, Eng. Channel, Bay of Biscay	341
S. China, Indochina, Indonesia and Philippines	284
Baltic	175
Japan, Korea and North China	168
Iceland and Northern Norway	133
North American West Coast	120
Australasia	118
Great Lakes	115
West Mediterranean	76
Others	673
Total Casualties by Region	2,687

These figures include total losses
of 85 during this period.

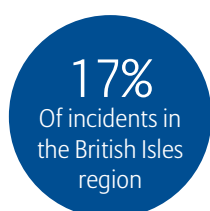
Source: Lloyd's List Intelligence Casualty Statistics.
Data Analysis & Graphic: Allianz Global Corporate & Specialty

All Casualties including Total Losses - Top 10 regions: 2006 to 2015

2006-2015: The British Isles, N. Sea, Eng. Channel, Bay of Biscay region has been the location of the most shipping casualties over the past decade with 17% of all incidents. Together, with the East Mediterranean and Black Sea region it accounts for a third of all incidents. Machinery damage (7,820) is the top cause of casualty, accounting for 31% of incidents. Collision ranks second (3,961) with wrecked/stranded (3,930) third.



Over the past decade



British Isles, N. Sea, Eng. Channel, Bay of Biscay	4,314
East Mediterranean & Black Sea	4,055
S. China, Indochina, Indonesia and Philippines	2,083
Japan, Korea and North China	1,779
Baltic	1,653
Great Lakes	1,323
Iceland and Northern Norway	967
West Mediterranean	887
North American West Coast	832
Gulf of Mexico	810
Others	6,731
Total Casualties by Region	25,434

These figures include total losses of
1,231 during this period

Source: Lloyd's List Intelligence Casualty Statistics.
Data Analysis & Graphic: Allianz Global Corporate & Specialty

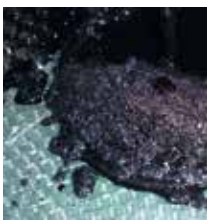
Recent Developments: 2015 in Review



- Safety concerns and responses ▶ 15



- Passenger ship casualties ▶ 21



- Lower emissions drive applauded but safety implications emerge ▶ 16



- Tianjin explosion: Supply chain exposure and storage risks ▶ 22



- Cargo liquefaction concerns remain ▶ 17



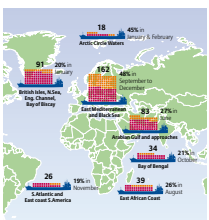
- Countering geopolitical instability ▶ 23



- Ship-building standards progress but MOL Comfort still an issue ▶ 18



- Höegh Osaka: Car carrier stability in the spotlight ▶ 23



- Global loss activity differs markedly, depending on time of year ▶ 19



- Drop in Arctic shipping temporary, as safety questions remain ▶ 24



- Safety impact of lower oil prices and depressed market conditions ▶ 20



The issue of car carrier stability remains in the spotlight following the grounding of the **Höegh Osaka** in January 2015 ▶ 23

Photo: Wikimedia Commons

Safety concerns and responses

It's been a year of change for the United Nations' global shipping regulator, the **International Maritime Organization (IMO)**, with Kitack Lim elected to the post of secretary-general in November 2015. The representative of South Korea officially started his mandate at the start of 2016 and in his inaugural message underlined the importance of strengthened partnerships between developing and developed countries, governments and industry, and IMO member states and regionsⁱ.

His predecessor, Koji Sekimizu, oversaw a number of safety-focused initiatives over his four-year term, a number of which came to fruition in 2015. One of the lynchpins of his tenure was to improve passenger ship safety and reduce the number of incidents worldwide. This drive culminated in the IMO Conference on the enhancement of safety of ships carrying passengers on non-international voyages, held in the Philippines in April.

The conference went on to adopt guidelines to help reduce what the IMO said was the mounting toll of accidents involving passenger ships. This **"Manila Statement"** acknowledged the urgent need to enhance the safety of ships carrying passengers on non-international voyages in certain parts of the world and urged states to review and update national regulations in relation to their passenger ferries and to apply the guidelinesⁱⁱ. For its part, the IMO's **Maritime Safety Committee (MSC)** is engaged on a continuous work program on improving passenger ship safety and at its

June 2015 meeting it approved draft amendments to the International Convention of Safety of Life at Sea (SOLAS) on evacuation analysis for all passenger ships. Also approved were draft amendments to SOLAS regulation II-1/22 to clarify when watertight doors may be opened during a voyage, which will be applicable to all shipsⁱⁱⁱ.

The IMO's work on mitigating the safety challenges presented by gas-fueled ships also came to a close in 2015 with the adoption of a new mandatory International Code of Safety of Ships using Gases or other Low-flashpoint Fuels (**IGF Code**). At its June 2015 meeting, MSC also agreed amendments to SOLAS chapter II-1, on design changes and the entry into force of the IGF Code, in addition to related amendments to chapter II-2 and the appendix^{iv}. The committee also adopted related amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (**STCW Code**), to include new mandatory minimum requirements for the training and qualifications of masters, officers, ratings and other personnel on ships subject to the IGF Code. The use of gas as a viable marine fuel has gained in popularity in recent years as high oil prices and environmental concerns have prompted owners to source alternative fuels. While crude oil and consequently marine fuel prices have dropped considerably over the past year, the IMO has pushed ahead with the IGF Code to ensure the market is ready on a regulatory level when interest in low-flashpoint fuels picks up again.



Obligatory audits

An initiative it is hoped will improve the safety record of shipping came into force on January 1, 2016. IMO member states now face obligatory audits under the **IMO Member State Audit Scheme** to determine to what extent they are implementing and enforcing IMO instruments and identifying areas in good practices and in need of improvement. A total of 25 member state audits are expected in 2016^v

ⁱ <http://www.imo.org/en/MediaCentre/SecretaryGeneral/Pages/Default.aspx>

ⁱⁱ <http://www.imo.org/en/MediaCentre/PressBriefings/Pages/16-ferry-conf-Manila.aspx>

ⁱⁱⁱ <http://www.imo.org/en/MediaCentre/MeetingSummaries/MSC/Pages/MSC-95th-session.aspx>

^{iv} <http://www.imo.org/en/MediaCentre/PressBriefings/Pages/26-MS-95-ENDS.aspx>

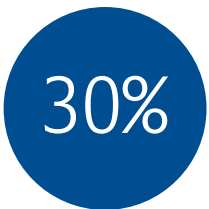
^v <http://www.imo.org/en/MediaCentre/PressBriefings/Pages/57-amendments-01012016.aspx>



Safety related tools approved

At its June 2015 meeting, the MSC adopted amendments to SOLAS regulations II-2/4.5 and II-2/11.6, clarifying the provisions related to the secondary means of venting cargo tanks in order to ensure adequate safety against over- and under-pressure.

Other safety-related guidelines and circulars approved at that meeting included Guidelines on Software Quality Assurance and Human Centered Design for **electronic navigation**; amendments to update the long-range identification and tracking (LRIT) system performance standards; a good practice guide for **Electronic Chart Display and Information Systems (ECDIS)**; and revised design guidelines and operational recommendations for ventilation systems in ro-ro cargo spacesⁱ



By 2025, the IMO projects that all new ships will be 30% more energy efficient than those built in 2015ⁱⁱⁱ

Lower emissions drive applauded but unexpected safety implications emerge

When shipping was deliberately omitted from the climate deal agreed at the 2015 Paris Climate Conference, known as **COP21**, in December 2015 the burden of responsibility for reducing emissions from shipping was left with the IMO. The IMO is no stranger to emissions control and has been proactively working to reduce emissions since 1997, when it first introduced an annex on the Prevention of Air Pollution from Ships to the International Convention for the Prevention of Pollution from Ships (**MARPOL**). From January 1, 2015, under the revised MARPOL Annex VI, the global sulfur cap permitted in marine fuels for ships sailing in prescribed Emission Control Areas was reduced from 3.50% to 0.10%. Globally, all ships will be required to burn marine fuels with a sulfur limit of 0.50% from January 1, 2020, subject to a feasibility review to be completed no later than 2018ⁱ.

While the drive to reduce emissions is applauded by AGCS, there have been unexpected safety implications connected with the use of ultra-low sulfur fuel that need to be considered. Engine problems and power issues have been reported and linked back to the rise in use of lower sulfur fuels, incidents that are expected to increase as regulations on sulfur content in fuel tighten further.

Captain Andrew Kinsey, Senior Marine Risk Consultant at AGCS has spoken with pilots about the effect of low sulfur fuel on engines and believes that its use presents a larger problem than at first thought. "Pilots have reported power losses during critical maneuvers," he says. "These lighter fuels are not used in the deep-sea trades, so we are seeing electrical blackouts when the ships are at their most vulnerable in tight areas and when changing speed. At worst, this could lead to groundings."

One challenge is that there is no standard specification for low sulfur fuels, making it difficult for engine manufacturers to give appropriate operation and maintenance advice. Hybrid fuels available on the market today may all have the same sulfur content but can be entirely different in their composition. "The question is:

are they all compatible with current engines?" asks **Captain Jarek Klimczak, Senior Marine Risk Consultant at AGCS**. "We need proper International Organization for Standardization (ISO) standards as a matter of urgency." Operators of older tonnage are required to make investments in additional tanks to separate fuels, but AGCS experts question whether this is being done in every case. Using the same tanks for mixed fuels could exacerbate fuel-related power and maneuverability issues.

"We have seen an increase in machinery claims in relation to fuel," confirms **Sven Gerhard, Global Product Leader Hull & Marine Liabilities at AGCS**. "The residues, or cat fines, are abrasive and if they are pumped into machinery they cause the cylinders to deteriorate within two to three years. A new cylinder could cost \$200,000 to \$300,000, which may not seem high, but if you have regular failures this soon mounts up." Better and more effective monitoring of bunker quality would go some way towards addressing the problem.



Photo: Wikimedia Commons

What are cat fines?

Cat or catalyst fines are a by-product of refining made-up of small particles of metal. These are deliberately added to marine fuels to "crack them". If they are not removed by purification they can cause serious damage and even engine failure which could lead to a collision or grounding.

ⁱ <http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Air-Pollution.aspx>

ⁱⁱ <http://www.imo.org/en/MediaCentre/MeetingSummaries/MSC/Pages/MSC-95th-session.aspx>

ⁱⁱⁱ <http://www.imo.org/en/MediaCentre/PressBriefings/Pages/55-paris-agreement.aspx>

Cargo liquefaction concerns remain

The all-too-often fatal outcome of shifting cargo was discussed again during 2015 with the IMO publishing a circular warning masters of the possible dangers of liquefaction associated with carriage of bauxite. The move was prompted by the findings of the investigation into the loss of the 10-year-old Bahamas flag bulk carrier **Bulk Jupiter**, which was carrying 46,400 tons of bauxite when it sank rapidly with 18 fatalities in January 2015. The circular reminded masters to ensure that the moisture limit is within specified boundaries and noted that while bauxite is currently classified as a Group C cargo (cargoes that do not liquefy or possess a chemical hazard) under the International Maritime Solid Bulk Cargoes (**IMSBC**) Code, there is a pressing need to raise awareness of the possible dangers of liquefaction associated with bauxiteⁱ. Additionally, at its June 2015 meeting, the MSC adopted a number of amendments to the IMSBC Code, all designed to improve requirements relating to cargoes that present a risk of liquefaction.

A number of alerts have been issued by Protection & Indemnity Clubs and insurers highlighting the dangers, but AGCS believes more could be done to reduce the risk of liquefaction. “This is an area where we really need the support of technology to test the moisture content of these cargoes,” says Kinsey. Gerhard adds that a lot of responsibility rests with the master, but they may not have sufficient support from their employer due to commercial pressures: “Our concern is that the decision is made is at the weakest point of the chain, which is unfair. We have to force this conversation as it needs further discussion.”

Captain Rahul Khanna, Global Head of Marine Risk Consulting at AGCS believes the industry has enough from a regulatory perspective to counter liquefaction, but implementation of those regulations is where the real problem lies and, while cargo testing standards are prescribed, they are not always aligned. “The key issue is that the existing regulations need to be followed and we need a method to check that is happening,” he adds. “Many regions lack the infrastructure to carry out modern moisture content checks on cargo that can liquefy and some certificates are being issued which may not be completely reliable”.



Photo: Shutterstock

How does liquefaction happen?

All bulk ore and concentrate cargoes are likely to have some moisture content. However, if the moisture content of the cargo reaches a specific level known as the flow moisture point (FMP), the frictional force will be lost and the cargo will behave as if it were a liquid and flow freely. As a result of liquefaction, carrying vessels may suddenly lose stability and take on a list or even capsizes.ⁱⁱ

“Many regions lack the infrastructure to carry out modern moisture content checks on cargo that can liquefy”

ⁱ <http://www.imo.org/en/MediaCentre/PressBriefings/Pages/38-bauxite-CCC.aspx>

ⁱⁱ www.martindale.com



The **MOL Comfort** broke into two approximately 200 nautical miles off the coast of Yemen in June 2013.

Photo: gcaptain.com

Ship-building standards progress but MOL Comfort concerns remain



Fatigue guidance review

The IMO's sub-committee on **Human Element, Training and Watchkeeping (HTW)**, initiated a revision of fatigue guidance in 2015, agreeing that the review should be completed by 2017. The review will adopt a risk-based approach and will consider the impact of fatigue at all levelsⁱⁱⁱ. The original guidance on fatigue mitigation and management dates back to 2001.

On the ship-building front, work continues on bringing goal-based construction standards into international mandatory regulations through the IMO, with the aim of improving ship strength and construction. Goal-based standards are comprised of at least one goal, functional requirement(s) associated with that goal, and verification of conformity that rules/regulations meet the functional requirements including goalsⁱ. These standards offer an alternative to the traditional prescriptive-based regulations for ship construction which have proved to be inflexible when it comes to regulating construction standards for modern ship designs. AGCS' Klimczak believes that goal-based standards offer the flexibility that traditional rules lacked, opening the door to innovation in ship design.

In addition to the progress of goal-based standards, 2015 saw the adoption of two unified requirements by the **International Association of Classification Societies (IACS)**, designed to improve the safety of large container ships by enhancing consistency between existing

classification society requirements. The rulings, known as UR S11A and UR S34, set a longitudinal strength standard and deal with loading conditions for container shipsⁱⁱ. Both are in response to the findings of the Japanese report into the 2008-built, 8,110 teu **MOL Comfort** casualty, which sank suddenly in 2013 about 200 nautical miles off the coast of Yemen.

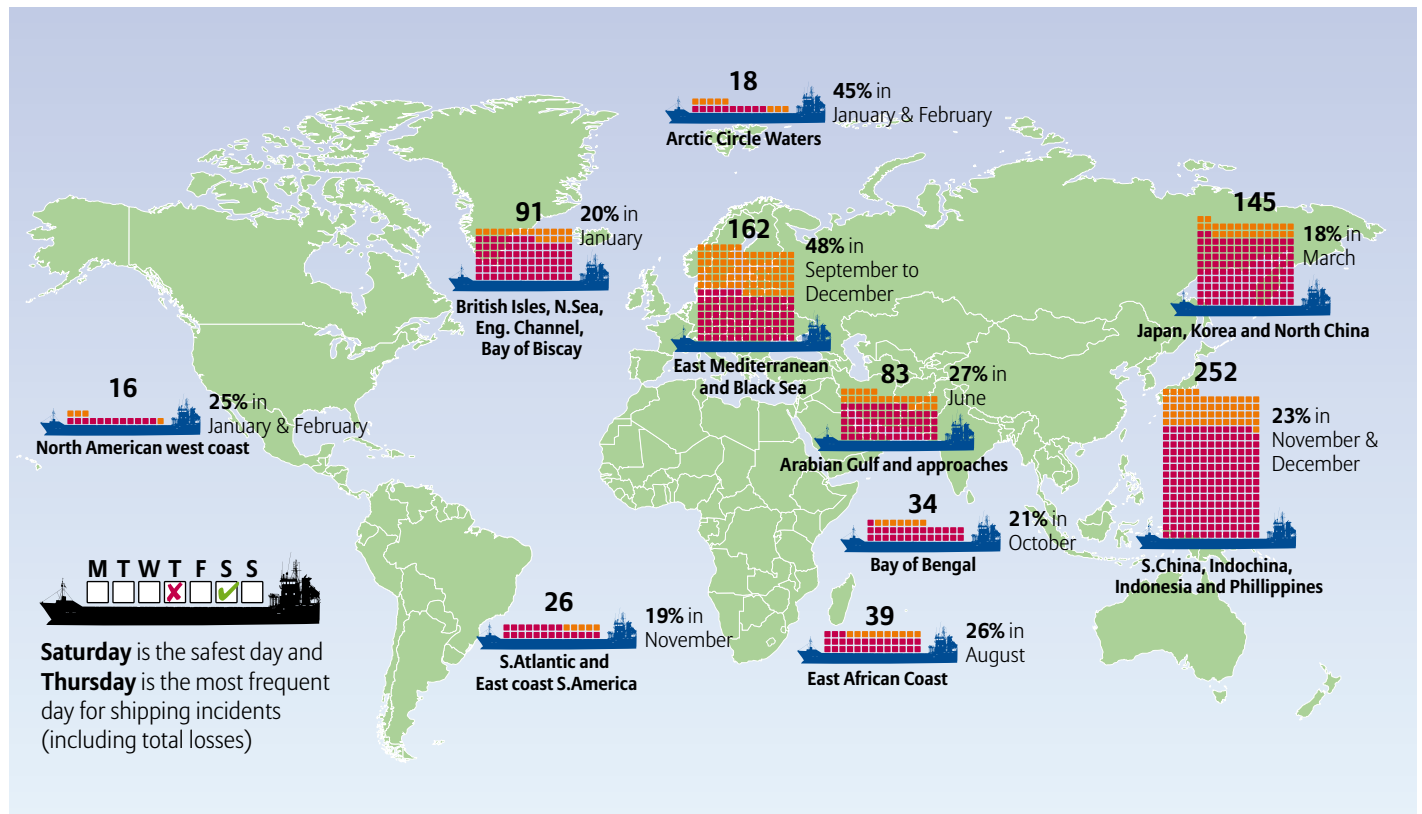
However, these rulings only apply to new ships, which AGCS experts find disconcerting. "The key issue here is that the new safety measures are for the construction of new ships, but that implies there is a question mark over the structural integrity of existing ships," says Kinsey. "We are concerned about this. The rules are certainly welcome but was the investigation of the MOL Comfort robust enough to address structural issues completely and entirely? These are questions that remain unanswered."

ⁱ <http://www.imo.org/en/OurWork/Safety/SafetyTopics/Pages/Goal-BasedStandards.aspx>

ⁱⁱ <http://www.iacs.org.uk/news/article.aspx?newsid=187>

ⁱⁱⁱ <http://www.imo.org/en/MediaCentre/MeetingSummaries/HTW/Pages/HTW-2nd-session.aspx>

Total Losses 2006-2015: When and Where In The World



Source: Lloyd's List Intelligence Casualty Statistics
 Data Analysis & Graphic: Allianz Global Corporate & Specialty. Selected regions.

Loss spikes all year round: Loss activity differs markedly around the globe, depending on time of year, analysis of 10 years of reported total losses shows. January is the worst month for losses in the **British Isles, N. Sea, Eng. Channel, Bay of Biscay region** accounting for 20% of annual losses over the past decade. Approximately one-in-five losses in the **Japan, Korea and North China** region occur in **March**. Over a quarter of losses in the **Arabian Gulf** occur in **June**. Almost half of losses in the **East Mediterranean and Black Sea** occur through **September to December**. Thursday is the most frequent day for shipping incidents around the world. Saturday is the quietest day.

The unluckiest ships:

Analysis shows that three different vessels share this title over the past decade, having each been involved in 19 reported incidents – a ro-ro vessel in the Great Lakes region of North America; a hydrofoil operating in the East Mediterranean & Black Sea; as well as a passenger ship operating in the British Isles.

The unluckiest ship name: Phoenix

In classical mythology the Phoenix is renowned as a unique bird which burned itself on a funeral pyre before rising from the ashes to live again. The Phoenix is also unique in the maritime loss world. Ironically, analysis shows that three vessels with this name have been lost over the past decade, making it the most common – and unluckiest – vessel name.

10%

Insolvencies in the global marine sector rose by 10% in 2015. Investments dropped by 7%.

Ludovic Subran
Chief Economist,
Euler Hermes

Safety impact of lower oil prices and depressed market conditions

The continuing weak global economy, depressed global commodities prices and an excess of ships combined to put extreme pressure on operating costs in 2015. With the two primary crude oil benchmarks at one time below \$30 per barrel – a 12-year low – the impacts on the shipping markets have been far reaching. While falling oil prices can be viewed as a positive factor in view of lower bunker expenses, at the current level, many exploration and exploitation projects become too costly to pursue and have been shelved until prices recover. This has an impact on vessel maintenance, repair and crewing, which have all suffered from the same lack of investment.

“It’s critical that economic pressures do not allow a ‘put it off until later’ mentality to set in,” warns Kinsey. “While offshore support companies can still operate, they cannot generate profits,” adds Klimczak, “so instead they turn to changing the nationality or the number of crew onboard in order to save costs, extending working hours, and implementing **condition-based maintenance (CBM)** (see page 34) without having detailed procedures and track records. These are grey areas, which are not well regulated.”

Machinery damage (see page 13) is the most common cause of shipping incidents, accounting for 36% around the globe. This statistic is troubling because preventative measures are often one of the first shipboard expenses to suffer in hard times.

Some owners are stretching maintenance to the longest possible intervals, while others face the decision of whether to lay-up vessels. With the latter option increasingly favored by operators, safety risks are heightened, according to Klimczak, especially when laid-up ships are reactivated. “Layups are not very structured because there are very few standards and no mandatory procedures for layup. In my view there is an urgent need for standardized layup procedures.” A further concern is the increasing obsolescence of ships that are laid-up for a period of time, only to return to a charter market that has moved on technologically in their absence.

“Looking at the long-term perspective, the reactivation of these vessels may constitute a painful exercise for the industry,” says Klimczak.

AGCS has observed an increase in frequency losses in 2015 (both in terms of number and loss amounts) which can, to some extent, likely be attributed to the economic environment.

“The economic downturn is likely to have a negative impact on safety,” says Khanna. “Many sectors, such as general cargo, bulk and offshore, are already challenged and any drop in safety standards will be a serious case for concern.”

“Less money spent on maintenance and safety is a contributory factor to casualties including total losses”

Top business risks in 2016: Marine & Shipping		2015 Rank	Trend
1	Market developments (<i>volatility, intensified competition, market stagnation</i>)	46%	New ↑
2	Theft, fraud, corruption	33%	4 (27%) ↑
3	Business interruption (<i>incl. supply chain disruption</i>)	31%	New ↑
4	Natural catastrophes (<i>storm, flood, earthquake</i>)	30%	3 (27%) ↓
5	Political risks (<i>war, terrorism, upheaval</i>)	20%	5 (21%)

Source: Allianz Risk Barometer 2016. Figures represent the number of responses as a percentage of all responses (between 40 and 149 responses per industry). More than one risk selected.

Passenger ship casualties

On the ship side, a slew of casualties with fatalities kept passenger ship incidents in the spotlight in 2015. The IMO sought to reduce the mounting toll of accidents involving passenger ships through the adoption of guidelines on the enhancement of safety of ships carrying passengers on non-international voyages, but AGCS experts question whether more needs to be done. Incidents such as the **Aung Tagun 3** which sank on March 13 off the coast of Myanmar, the **Kim Nirvana-B** which sank on July 2 off Ormoc, Leyte, and the **Dong Fang Zhi Xing** which sank on June 1 in the Yangtze River – all with multiple fatalities – emphasize the ongoing issue with passenger ship safety.

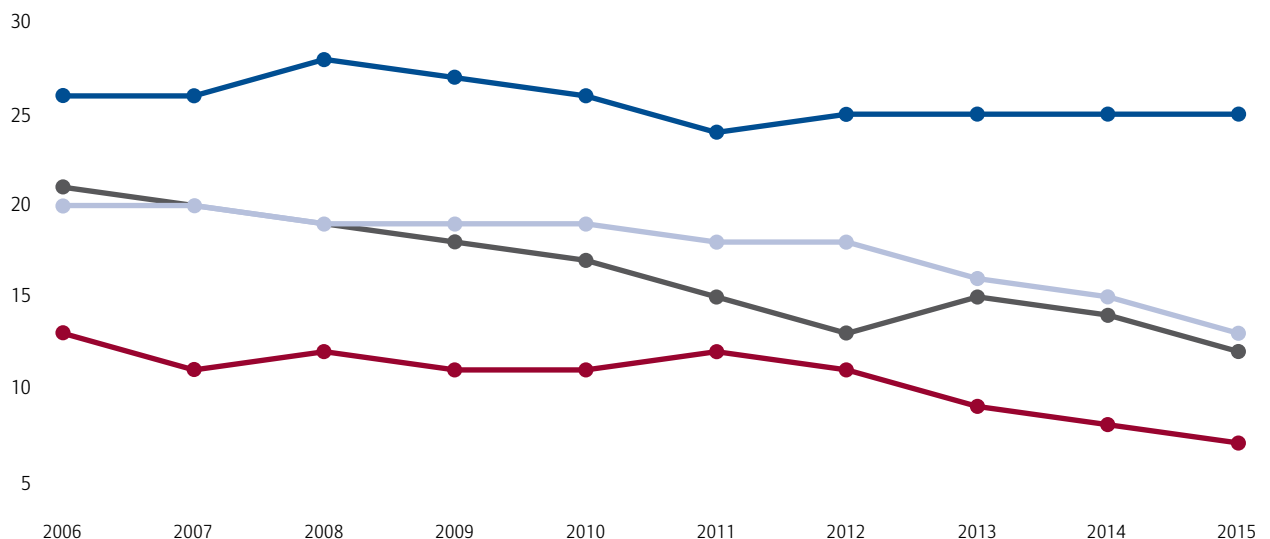
Singapore-based Klimczak believes that passenger ship standards in Asia are many years behind the rest of the world. “The quality of class in many territories in this region is far below any recognized international standards. We only hear about the accidents which involve casualties, but there are many more accidents that we do not hear about.” With frequent sailings, and pressure to

turn a profit, passenger ship owners in the region are finding it difficult to schedule in necessary maintenance.

The problem is split between developed and emerging countries. Standards exist for the first but are they resilient enough, asks Gerhard. For the latter, there’s a question mark over whether global safety standards have even penetrated and, if they have, are being enforced. “As a global company, we are building relationships with these countries; we need to share information with local insurers. While we are not the world’s police we have an obligation to assist. We want to make sure standards are agreed and adhered to.”

Khanna agrees: “We, as the industry, need to find ways to penetrate into these regions. The industry should try to raise awareness within the local ferry communities. Enforcement of the regulations is down to the local government and direct influence can be difficult.”

Total Losses: Five year moving loss average by top regions 2006-2015 (All vessels)



The East Mediterranean and Black Sea, Japan, Korea and North China and British Isles, N.Sea, Eng. Channel, Bay of Biscay maritime regions have all seen their five year moving loss average totals improve considerably over the past decade. Conversely, the South China, Indochina, Indonesia and Philippines five year moving loss average has seen little change.

- S.China, Indochina, Indonesia and Philippines
- East Mediterranean and Black Sea
- Japan, Korea and North China
- British Isles, N.Sea, Eng.Channel, Bay of Biscay

Source: Lloyd’s List Intelligence Casualty Statistics.
Data Analysis & Graphic: Allianz Global Corporate & Specialty

Tianjin explosion: Supply chain exposure and storage risks



“Just-in-time” supply chain

Holding the right amount of inventory to meet both production process and customer demands.

Supply chain issues were brought to the fore in 2015, after a series of explosions in a warehouse at China’s **Port of Tianjin** on August 13 killed 173 people and injured hundreds, revealing the pitfalls of a “**just-in-time**” supply chain.

Tianjin is one of the world’s top container ports by volume and the effect of the blasts was far-reaching. All ship calls to the port were immediately suspended after the explosion, a ban that continued as authorities investigated the blasts. Calls from cargo ships had largely resumed by August 19, but with 285 of the **Fortune Global 500** companies having facilities in Tianjin, the potential for supply chain disruption continuedⁱ.

Goods which were channeled through Tianjin before the explosions were diverted elsewhere, and access to value-add services and raw material imports was severely curtailed. Confirmed insurance industry losses

via company announcements had already totaled approximately **\$2bn** towards the end of 2015ⁱⁱ. However, the **International Union of Marine Insurance (IUMI)** has said the insured loss, including clean-up costs, damage to cars and other products stored at the site could total between \$5bn to \$6bnⁱⁱⁱ.

“The supply chain exposure of the Tianjin explosions was fascinating,” says Kinsey. “It really highlighted the delicate balance we have in ‘just-in-time’ supply chains, which are only as secure as their weakest link.” Khanna calls for more transparency on accumulation risks and better information gathering on the back of the incident: “There needs to be a greater flow of information between the assured and the insured to understand these risks. Information flow needs to be improved, especially on storage risks. Once we improve information flow we can do more to prescribe best practice and guidelines.”



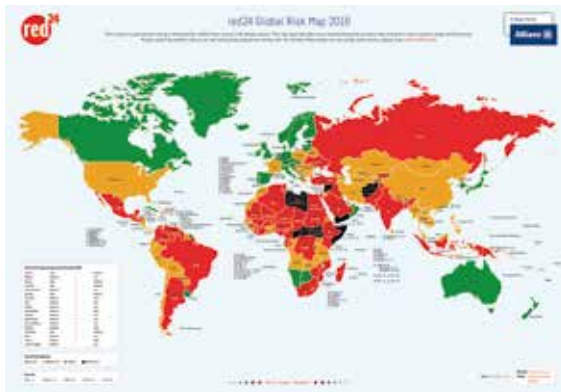
Supply chain and accumulation risk in the wake of the Tianjin explosion is an increasing concern.
Photo: Voice of America, Wikimedia Commons

ⁱ http://www.chinaforgroups.com/Top_Ten_Business_Destinations_in_China.html

ⁱⁱ www.agcs.allianz.com/insights/white-papers-and-case-studies/global-claims-review-2015/

ⁱⁱⁱ <http://www.hampden.co.uk/hampden-agencies/client-resources/newsroom/2015/tianjin-update/>

^{iv} http://www.mfa.gov.tr/no_-148_-11-may-2015_-press-release-regarding-the-dry-cargo-ship-attacked-off-tobruk_libya.en.mfa



Geopolitical instability is increasing in many regions
Photo. www.red24.com

Countering geopolitical instability

During 2015, risks to shipping in the Middle East Gulf and surrounding waters escalated as politically-charged disputes took hold. In May, a Turkish cargo ship was shelled from the Libyan coast as it approached Tobruk port and then attacked from the air as it tried to leave the areaⁱ.

The attack on the **Tuna-1** killed the ship's third officer and marked the second fatal strike against merchant shipping by the Libyan government's air force in 2015. In Yemen, the ongoing war and blockades had not affected ships sailing through the Gulf of Aden at time of writing, but calls at the country's ports had been curtailed, with Aden accepting a fraction of the calls it handled before the dispute.

In North Africa, the Egyptian Armed Forces officially declared a "state of war" in July 2015. Again, the war and disputes there has not had a notable effect on shipping, but with Egypt's control of the critical shipping chokepoint, the Suez Canal, shipping is keeping a watchful eye on events in this country. AGCS' Khanna points out that while there are certainly physical risks to consider, there are also operational risks to shipping through unexpected port closures and delays to vessels, not forgetting economic impacts that need to be considered.

Gerhard warns that while additional insurance coverage can provide financial protection, ship operators should take adequate precautions when operating in sensitive areas. "Operators must remember that the provision of war insurance does not mean that the taking of cargo from this area is safe; insurance should not be viewed as a safety blanket."

ⁱ <https://www.gov.uk/maib-reports/listing-flooding-and-grounding-of-vehicle-carrier-hoegh-osaka>

ⁱⁱ <http://www.bbc.co.uk/news/uk-england-hampshire-35823182>

ⁱⁱⁱ <https://www.gov.uk/government/publications/safety-lessons-assessing-adequate-stability-before-departure>



Photo: Mike Searle, Wikimedia Commons

Höegh Osaka: Car carrier safety remains in the spotlight

The issue of car carrier stability remained in the spotlight during 2015, which was marred by the grounding of the 2000-built 51,770 gt pure car carrier **Höegh Osaka** (pictured) in January. It developed a list shortly after departing Southampton, UK, for Bremerhaven in Germany. According to a report into the incident by the **Marine Accident Investigation Branch (MAIB)** in March 2016ⁱ the Höegh Osaka's actual cargo weight and stowage were significantly different to the final cargo tally supplied to the ship.

The report said: "Cargo distribution was such that the upper vehicle decks were full while the lower vehicle decks were lightly loaded. The ship's inadequate stability had not been identified as no accurate stability calculation had been carried out before the ship sailed." It also said no stability estimation had been completed after all the cargo had been loaded, which had "become the norm" in the car carrier sector in generalⁱⁱ.

The MAIB has issued a safety flyer highlighting the importance of assessing a ship has adequate stability for its intended voyage on completion of cargo operations and before it sails, as well as entering accurate information into the ship's loading computer and the master's responsibility for his/her shipⁱⁱⁱ.

Appropriate training remains vital to maintaining safety levels. Crews and pilots need to be adequately trained as a loss of stability on one of these ships could be disastrous. "It's key that we keep the focus on safety standards for these types of ships," says **Captain Rahul Khanna, Global Head of Marine Risk Consulting at AGCS**.



Australian fishing vessel, the **Antarctic Chieftain** stuck in Antarctic ice; one of two reported shipping incidents in the South Pole maritime region during 2015. Arctic Circle waters also saw an increase in incidents during 2015.

Photo: United States Coast Guard, Wikimedia Commons

Drop in Arctic shipping temporary, as safety challenges remain

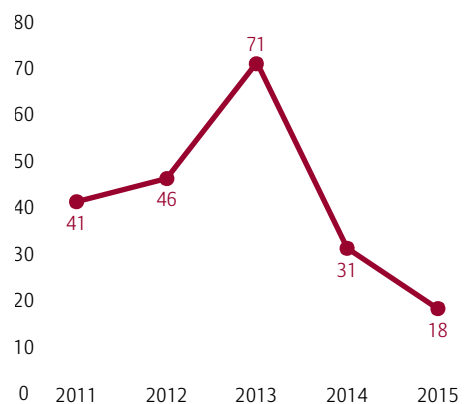
Lower oil prices have had an impact on the uptake of commercial sailing activity on the Arctic's Northern Sea Route, (see graph). With bunker prices virtually a third of the price they were two years ago, there is less incentive to find sailing routes which will burn less fuel. That said, evident pressures on operating margins means that operators are still interested in reduced sailing times that promise a saving of more than 10 days over a more traditional routing. There is also increased interest in cruises in sensitive Arctic water, and oil and gas exploration continues, albeit on a reduced level.

Kinsey believes a reduction in shipping activity in Arctic waters is temporary as the need for passages through this route will intensify when oil prices recover.

In December 2015 vice premier Dimitry Rogozin said "Russia has all the technological possibilities to make the Northern Sea Route operational round the year and in any season" in future at an Arctic international forumⁱ.

Despite the adoption of the International Code for Ships Operating in Polar Waters (**The Polar Code**) by the IMO during 2015ⁱⁱ, tremendous challenges to operations in this area remain.

Northern Sea Route Transits



Source: Northern Sea Route Information Office
Graphic: Allianz Global Corporate & Specialty

ⁱ <http://www.arctic-lio.com/node/231>

ⁱⁱ <http://www.imo.org/en/MediaCentre/PressBriefings/Pages/19-MEPC-68-outcome.aspx>

71

Number of shipping casualties (incidents) in Arctic Circle waters in 2015. There were just 8 in 2006.

“When we look at the Arctic we really can’t wait until the last minute to ensure safe operations,” warns Kinsey. “These things need to be studied and developed in advance of wider use of the Northern Sea Route. We have to try and get away from the reactive mindset and get into the proactive mindset.”

The mandatory Polar Code is expected to enter into force on January 1, 2017 and it is anticipated that the code will need revision after implementation. As the Northern Sea Route is presently a seasonal shipping route, at the very minimum, problems encountered and best practices to employ should be outlined at the end of each season.

Arctic Circle Waters

All Casualties including Total Losses 2006-2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Machinery damage/failure	3	5	13	14	16	12	13	20	27	46	169
Wrecked/stranded	4	10	11	14	9	9	8	10	14	6	95
Miscellaneous		5	1	4	4	2	6	5	5	6	38
Fire/explosion		3	1	2	6	6	1	4	2	4	29
Collision			1	4	10	4	4	2		3	28
Contact (eg harbor wall)		1	1	1	3	1	3	6	4	5	25
Hull damage	1	3	1	6	2	2	1	2	1	1	20
Foundered		1	1	2		3	1	1	2		11
Total	8	28	30	47	50	39	37	50	55	71	415

including 18 total losses

Source: Lloyd’s List Intelligence Casualty Statistics

Data Analysis & Graphic: Allianz Global Corporate & Specialty

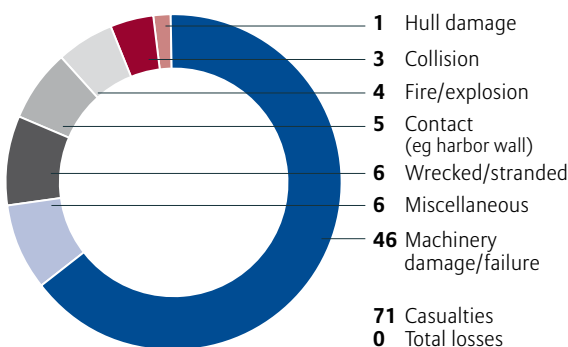
29%

Annual increase in number of shipping incidents year-on-year in Arctic Circle waters.

The analysis shows there have been 415 reported shipping incidents in Arctic Circle waters over the past decade including 18 total losses. The number of incidents has increased for three years in a row with the 2015 casualty total the highest in a decade. Machinery damage/failure (169) was the cause of 41% of incidents. Wrecked/stranded (95) was the second top cause of incident. Almost a third of incidents involved fishing vessels (130), while 17% involved cargo vessels (71).

Arctic Circle Waters

All Casualties 2015



The analysis shows there were 71 reported shipping incidents in Arctic Circle waters during 2015, up 29% year-on-year. Machinery damage/failure (46) was the cause of 65% of these incidents, driven in part by the harsh conditions. Fishing vessels (27) accounted for 38% of incidents, doubling the total from a year earlier (13).

Source: Lloyd’s List Intelligence Casualty Statistics.

Data Analysis & Graphic: Allianz Global Corporate & Specialty

Looking ahead: In the pipeline



- Cyber risk: “Internet of Things” and piracy among increasing exposures ▶ 27



- Future crewing shortage and training issues ▶ 33



- Piracy incidents up: Asian waters rank top. African progress continues ▶ 28



- The return of Iran: Safety standards in the spotlight ▶ 34



- Salvage challenges for “mega ships” ▶ 30



- Condition-based maintenance: Benefits and safety concerns ▶ 34



- Superstorm ship sinkings ▶ 32



- Readiness for container weighing regulations ▶ 35



- No relief from seafarer fatigue issues ▶ 33



Cyber security guidelines

Recognizing the threat to safety, environment, hull, machinery and surveying, the International Association of Classification Societies (IACS) has created a cyber-system safety framework in support of ongoing work on the subject at the IMO^{iv}. From the ship operator's viewpoint, shipping organization BIMCO, in cooperation with CLIA, ICS, INTERCARGO and INTERTANKO, has launched a set of guidelines to help the global shipping industry prevent major safety, environmental and commercial issues that could result from a cyber incident onboard a ship^v

The "Internet of Things" and piracy increasing cyber exposures

The shipping industry still has some catching up to do in getting to grips with the scope and nature of cyber risk.

Cyber-attacks on the shipping industry are often under-reported as companies opt to deal with breaches internally for fear of worrying stakeholders. When reports of attacks do surface, details are usually vague, making it extremely difficult to gauge the headway the industry has made in strengthening online security.

Examples of cyber security issues reported to date include a hacker causing an oil platform located off the coast of Africa to tilt to one side, thus forcing it to temporarily shut down. Hackers have also infiltrated cyber systems in a port to locate specific containers loaded with illegal drugs and remove them undetected.

Cyber security is high on the International Maritime Organization's (IMO) agenda, although having considered a number of submissions relating to cyber security at its June 2015 meeting, the MSC referred the topic to its 96th meeting in May 2016. The committee urged member states and international organizations to "collaborate on proposals for guidance on maritime cyber security" for submission at this meetingⁱ.

As an IMO facilitation committee document submitted to advance the development of such cyber risk guidelinesⁱⁱ notes, although the maritime industry's cyber technologies and systems provide significant efficiencies and benefits for shipboard operations they also introduce "serious, and potentially grave, operational risks". Risks can result from improper integration of cyber systems, the unaccounted and unintended consequences of system updates, the interactions between the cyber systems of ships and ports, or the malicious attacks and threats from outside sources. Furthermore, vulnerabilities and unauthorized activities on vital cyber systems are not always readily apparent to users.

More needs to be done to educate shipping companies, say AGCS experts. "Shipping is still a long way from where it needs to be in terms of protection and security. While we as insurers can try to raise awareness and provide insurance solutions, generally the risk is not well understood and the consequences can be disastrous," says **Captain Rahul Khanna, Global Head of Marine Risk Consulting at AGCS.**

That said, a **Cyber Risk Information Paper** from the Joint Hull Committee in conjunction with legal firm Stephenson Harwood finds that the risk of a loss to a ship as a result of cyber disruption is "foreseeable, but is not yet a reality" (the technical working group which produced this paper was chaired by **Chris Turberville, Head of Marine Hull & Liabilities, UK, AGCS**). But while the risk of loss or damage caused to, or by, a ship as a direct result of cybercrime is currently low for bulk or general cargo shipping, more specialized or technically-advanced ships engaged in oil and gas exploration and exploitation are more susceptible through their use of remote systems and Dynamic Positioningⁱⁱⁱ.

"While the likelihood of a cyber event that cuts off half of world trade is low and is more theoretical, the exposure is growing and there needs to be more in-depth research on how to improve systems and people," says **Sven Gerhard, Global Product Leader Hull & Marine Liabilities at AGCS.**

In a worrying turn, pirates may have caught on to the possibilities of abusing holes in cyber security to target orders for specific cargoes, according to **Captain Andrew Kinsey, Senior Marine Risk Consultant at AGCS.**

"Pirates appear to have access to refineries and are able to find out who is carrying the fuel they want. Then they just need to look at the **Automatic Identification System (AIS)** information for the ship and they can go alongside, overpower the crew, take over the ship, disable the communications, siphon off the cargo and leave the ship adrift."

ⁱ <http://www.imo.org/en/MediaCentre/MeetingSummaries/MSC/Pages/MSC-95th-session.aspx>.

ⁱⁱ <http://www.nepia.com/media/406456/FAL-40-INF5-Information-on-Cyber-Risk-Management-Best-Practices-Cana.pdf>

ⁱⁱⁱ http://www.lmalloyds.com/LMA/News/whats_hot/JHC_Cyber_Info_Paper.aspx

^{iv} <http://www.iacs.org.uk/news/article.aspx?newsid=194>.

^v https://www.bimco.org/News/2016/01/04_Cyber_security_guidelines.aspx

In addition, there has already been one known incidence of Somali pirates having infiltrated a shipping company's systems to identify vessels passing through the Gulf of Aden with valuable cargoes and minimal on-board security, leading to the hijacking of a vessel.

Kinsey believes that the industry needs more robust cyber technology and suggests making better use of technology to monitor the movements of stolen cargoes. Ongoing implementation of electronic navigation is also a potential conduit for cyber incidents, adds Kinsey: "The cyber impact cannot be overstated; it goes hand in hand with e-navigation – the simple fact is that you can't hack a sextant."

Piracy incidents up: Asian waters rank highest globally as African progress continues

For the first time in five years there was a reported increase in the number of actual and attempted piracy attacks during 2015, albeit by just one incident (**246 compared with 245 in 2014**), according to the International Chamber of Commerce's **International Maritime Bureau (IMB)** annual piracy report.

Although the numbers of vessels hijacked and crew members captured declined year-on-year, the IMB's Piracy Reporting Center (IMB PRC) noted that the number of vessels boarded increased 11% to 203. Meanwhile, kidnappings – where crew are taken away and held for ransom – doubled to 19 in 2015, all the result of five attacks off **Nigeria**.

The number of reported piracy incidents in Nigeria may have declined year-on-year (14 compared with 18 in 2014), but the country remains a hotspot for violent piracy, as evidenced by an incident on February 5, 2016, when the Nigerian Navy prevented a group of pirates from hijacking the 28,844 dwt containership **Safmarine Kuramo**, carrying 25 crew members.

And while it ranks as the fourth top location globally for piracy, many Nigerian incidents still go unrecorded.

On the east coast of Africa, while the civil war in **Somalia** is ongoing, piracy in the region has been largely quashed through the efforts of international navies. For the first time in five years no Somali-based attacks were reported during 2015. However, the potential for an attack remains high.

Attacks in the **South East Asia** continue to increase with this region now accounting for around 60% of global incidents. Almost 55% of the region's 147 attacks were against moving vessels compared with 37% a year earlier. Most were aimed at low-level theft. IMB cites this increase as a cause for concern as it increases potential risks to vessels and crew.

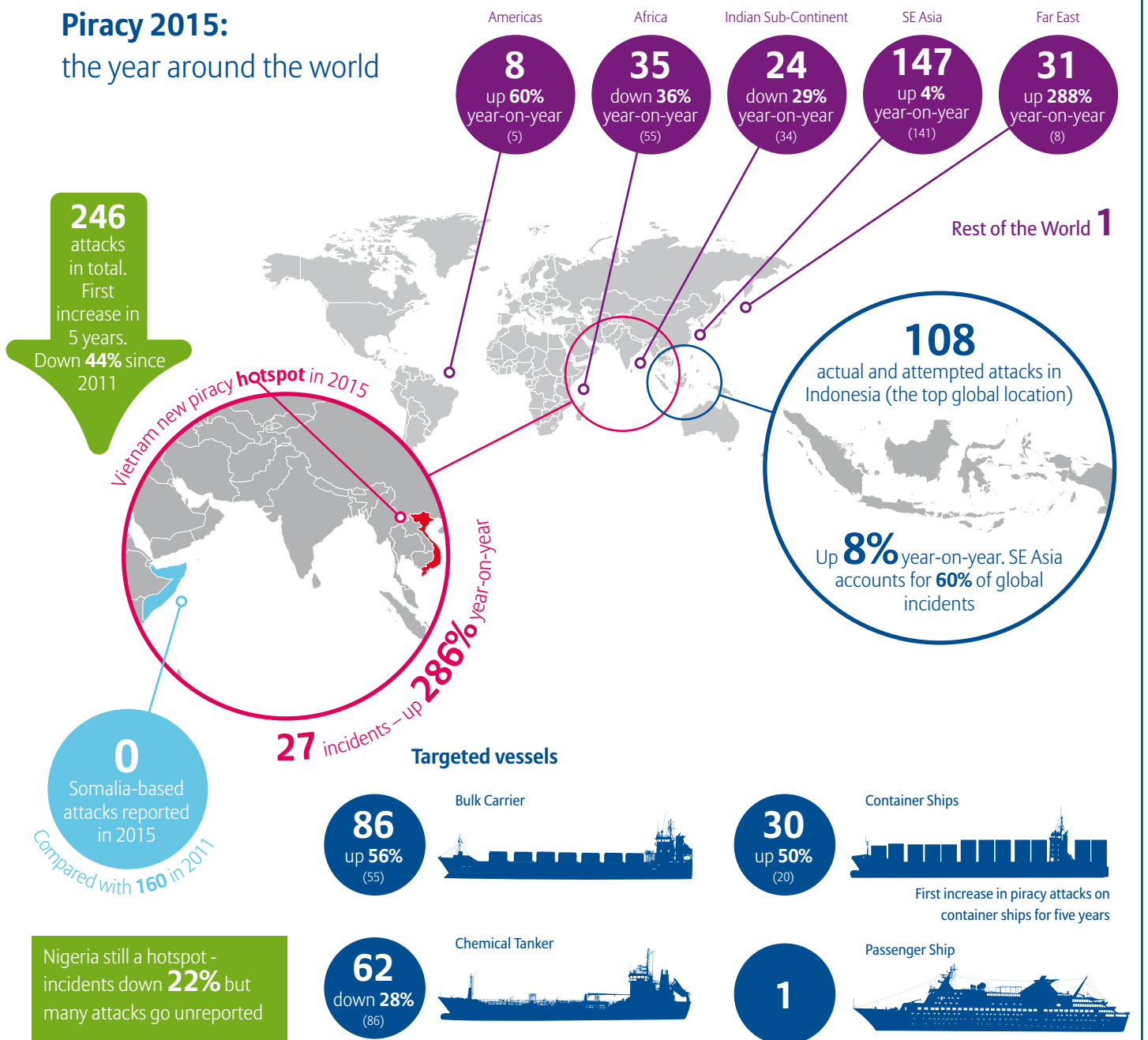
"A problem in the South East Asia region is that the traffic is very dense and different national territorial waters are adjacent to each other, making it very hard to distinguish who has responsibility," points out **Captain Jarek Klimczak, Senior Marine Risk Consultant at AGCS**.

Indonesia remains the top global hotspot, with a slight increase in incidents year-on-year despite incidents having declined in the majority of 11 ports, with only Belawan and Nipah recording marked increases in attempted thefts, according to the IMB.

Meanwhile, the **Far East Asia** region saw the biggest increase year-on-year in incidents (288% to 31), driven by a surge of incidents in **Vietnam** from seven to 27. The main cause is low-level theft against vessels anchored in Vietnam, with 15 reports from around the port of Vung Tau alone.

As the Joint Hull Committee’s Cyber Risk Information Paper predicts, technological advances such as **“The Internet of Things”**, allied with the communications systems and protocols required by e-navigation will move shipping technology significantly toward the point where “the insurance market has less than five years to prepare itself for the risk of a cyber-attack at sea materializing into a hull and machinery loss.”

Piracy 2015: the year around the world



Source: International Maritime Bureau Data Analysis & Graphic: Allianz Global Corporate & Specialty



What's in a teu?

Container ship capacity is measured in 20-foot equivalent units (teu). Typical loads are a mix of 20-foot and 40-foot containers. The world's largest container ship – the 19,000+ teu MSC Oscar has the capacity to hold **1.15 million washing machines**.



A 19,000+ teu mega ship was grounded and stuck in the river Elbe in Germany during February 2016 for five days
Photo: Shutterstock

Salvage challenges for “mega ships”

The thirst for ever-larger container ships continued through 2015 with Mediterranean Shipping Company's 19,224 teu “**mega ships**” arriving on the market. At 395m long, 59m wide and 30m in depth, the 193,000gt **MSC Oscar** made headlines around the world as it assumed the title of the world's largest container ship. This colossal vessel has a deck area equivalent to four football fields laid end-to-end. If it was stood upright out of the water at 395m it would be taller than the Empire State Building (381m).

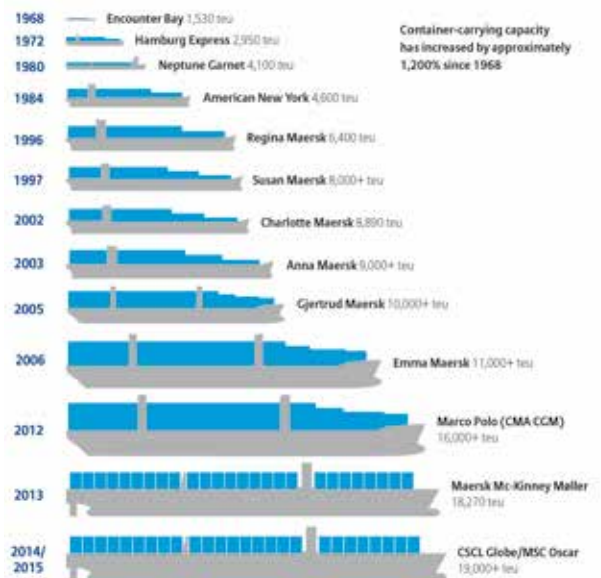
As well as demonstrating the remarkable innovation and growth of a maritime industry, which has seen cargo-carrying capacity increase by over 70% over the past decade, the arrival of such “mega ships” also brings concerns about increasing risk, safety issues and salvage difficulties, (see page 31).

In February 2016 another 19,000 teu mega ship, the China Shipping Container Lines (CSCL) vessel, the **Indian Ocean** made headlines for different reasons when it was grounded and stuck in the river Elbe in Germany for five days, eventually being pulled free by a fleet of 12 tugs. Later that month, the 13,892 teu **APL Vanda** was grounded on Bramble Bank in the UK, scene of the grounding of the **Höegh Osaka** a year earlier.

While there is still a dearth of suitable places of refuge and only a limited number of ports able to handle these mega ships, there is one area where the industry is taking steps to reduce the safety risks large ships present. A

“**salvage friendly**” ship concept made inroads in 2015 with the take up of fast oil recovery systems to speed up the removal of oil and hazardous liquids from a casualty, and attempts by shipyards to design casualty-ready ships. “These designs will need to take into account preparedness and methods to deploy and mobilize salvage equipment in conjunction with existing vessel designs,” says Klimczak. “Naval architects will be challenged with limited options for ballasting, maintaining or recovering stability, all the while ensuring

50 years of Container Ship Growth



Source: Allianz Global Corporate & Specialty
Approximate ship capacity data: Container-transportation.com

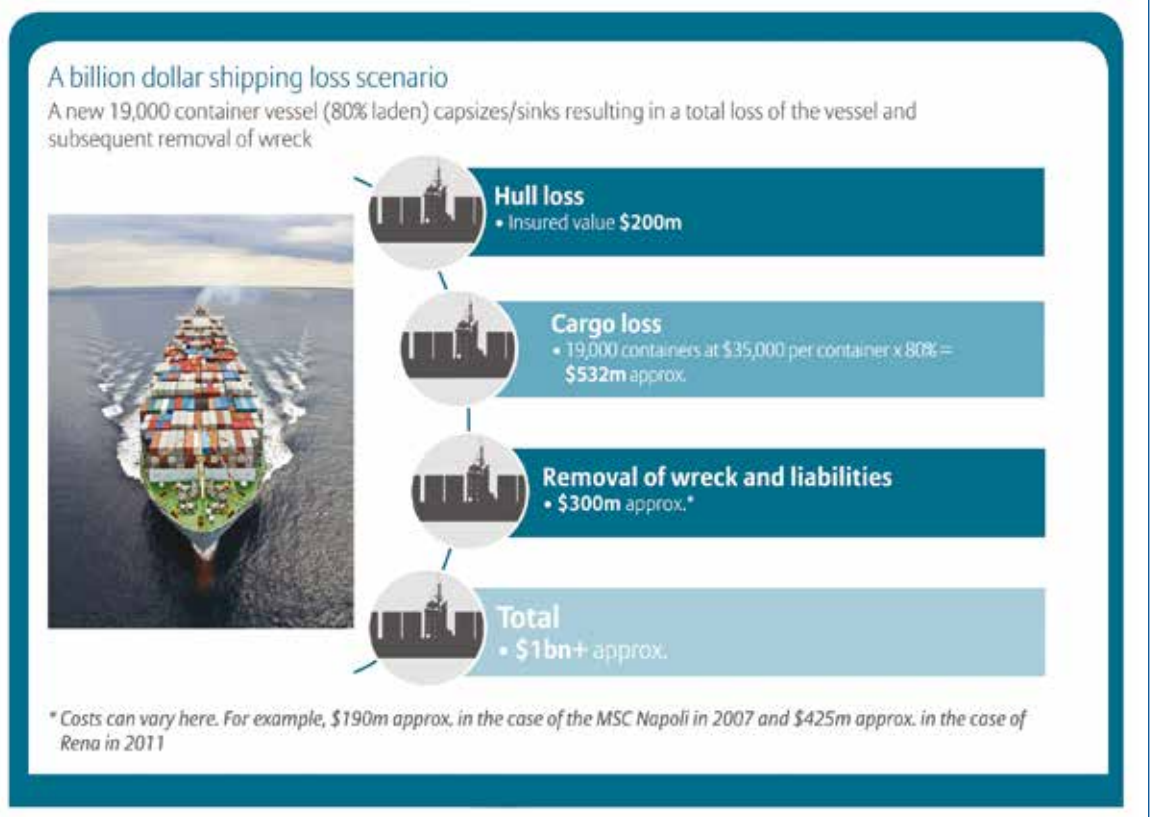
How a billion dollar loss could occur....

The introduction of “mega ships” to the world maritime fleet has raised fears about the potential for higher losses if a casualty occurs. These ships test port and canal capacity, as well as crew skills.

There are many factors to consider when evaluating the cost of a potential loss scenario resulting from an incident involving such vessels. Most significantly, the average value of the contents of the containers and whether the vessel is completely laden or not, but also

other influences such as shipping route/location. In addition, if there is a salvage/removal of wreck situation, the major concern is that salvors do not have the equipment and resources to effectively deal with this. Such uncharted territory makes the potential costs of an event more problematic to calculate.

Considering such variances, a possible billion dollar scenario is listed below:



structural integrity. All casualties requiring the assistance of salvors are difficult as each one presents its own unique set of circumstances. Because of their magnitude, salvage of an ultra large ship unites those challenges.”

However, insurers raise concerns that mergers and acquisitions in the salvage business have reduced easy access to the specialist salvors required for recovery work on this scale. As a highly intensive capital business, salvors need to have a ready fleet of large, powerful tugs and access to expensive specialist equipment. That hardware

also needs to be geographically spread to enable fast response, regardless of where a casualty occurs. However, commercial realities and the sporadic nature of this type of work means that this is increasingly not possible.

“We will face a situation like the **Costa Concordia** again and the rule book will have to be re-written,” warns Kinsey. “Salvage today is a very costly endeavor; you don’t have the traditional salvage equipment that was about in the 1970s and 1980s. Now you are dealing with very expensive equipment.”

Superstorm ship sinkings

Weather has always posed a significant threat for mariners but “exceptional” weather events are becoming more commonplace, bringing with them safety risks for shipping and disruption to global supply chains. This year, the effect of a heightened El Niño, dubbed ‘**super El Niño**’, is expected to lead to more extreme weather conditions, especially in countries bordering the Pacific Ocean. El Niño is defined by prolonged warming in Pacific Ocean sea surface temperatures when compared with the average valueⁱ.

The results are extremes of weather conditions, such as increased participation and stronger winds. There have been two recorded ‘super’ El Niños to date, in 1982-83 and 1997-98. The United Nations said in January that the strength of the current El Niño has “put our world into uncharted territory”ⁱⁱ, such has been the severity of storms and winds experienced around the world.

For the shipping industry, these weather extremes heighten safety risks at sea and in port. Extreme weather conditions have been put forward as the cause of the sinking of TOTE Maritime’s 1975-built, 600 feu **El Faro**. When the ship departed Jacksonville on route to San Juan, Puerto Rico, on September 29, 2015 the crew were monitoring what was then Tropical Storm Joaquin. Then, on October 1, TOTE lost all communication with the El Faroⁱⁱⁱ. On October 5 the US Coast Guard confirmed that the ship had sunk in 15,000 feet of water



One of the world’s largest cruise ships, the **Anthem of the Seas**, was forced to return to port after it was struck by 30ft waves and winds of up to 100mph in the Atlantic Ocean in February 2016. More extreme weather conditions are anticipated.

with no survivors. Hurricanes and bad weather were a contributing factor in at least three of the five largest vessels lost during 2015 (see page 7).

“The fact that superstorms are causing ships to sink is concerning,” says Gerhard. “We are seeing more and heavier nat cat events.” Heavy weather and adverse swell also led cargo to shift in the 2007-built, 55,652 dwt **Alam Manis** in July. The ship developed a 20-degree list off the Philippines after its cargo of nickel ore shifted. Twenty of the crew of the bulk carrier were safely transported to shore, with one fatality recorded.

In November two rare cyclones a week apart killed 26 people and left nearly 6,000 families displaced in Yemen^{iv}. Tropical cyclones are rare over the Arabian Peninsula and to be hit by two back-to-back is an extraordinary event. “This has had a catastrophic impact on Yemen, but importantly the North Arabian Sea has so many shipping transits,” says Kinsey. “If we see more of these type of weather phenomena it will definitely impact the supply chain and we may see a return to near-shoring.”



The El Faro sank in October 2015. Hurricanes and bad weather were a contributing factor in at least three of the five largest vessels lost during 2015.

Photo: Wikimedia Commons

ⁱ http://www.cpc.noaa.gov/products/analysis_monitoring/ensostuff/ensofaq.shtml#HOWOFTEN

ⁱⁱ <http://www.un.org/apps/news/story.asp?NewsId=52959#.VpTctllu1q9>

ⁱⁱⁱ <http://www.totemaritime.com/puerto-rico-news/oct-2-update-from-tote-maritime-puerto-rico-on-el-faro/>

^{iv} <http://reliefweb.int/report/yemen/yemen-cyclones-chapala-and-megh-flash-update-11-19-november-2015>



No relief from seafarer fatigue issues

Seafarer fatigue continues to be a tremendously important issue, with an increase in fatigue-related claims over the past decade. The IMO, through MSC, produced guidelines on fatigue in 2001 and is now, through its sub-committee on Human Element, Training and Watchkeeping, looking to review those guidelinesⁱ. The review will examine the impact of fatigue at all levels and produce practical tools for fatigue management. However, the results are not expected until 2017 and AGCS believes this is an issue that needs addressing much sooner.

“Fatigue will continue to be an issue as the drive to do more with less continues through 2016, aggravated by the pressure to cut costs,” says Kinsey. Gerhard adds that with crew numbers often at their lowest possible level, there will be no relief from fatigue-related issues. While AGCS welcomes the move by the IMO to review its guidelines, its experts stress that the industry needs to embrace the findings to ensure that any revised guidelines are not left to gather dust on the shelf.

Future crewing shortage and training issues

With a need for an additional 42,500 officers by the end of 2019 to crew the expanded fleet, there is expected to be a shortfall of about 15,000 officers and engineers within three yearsⁱⁱ. There are expectations that officers working longer shift patterns will offset some of the shortfall, which is a concerning trend for AGCS’ experts. “We are multi-tasking our crews and then talking about reducing the numbers; as an industry we are not supporting these people,” says Kinsey. There are also complaints about a lack of coherent initiatives to promote the attractiveness of a career at sea and this, coupled with lower-than-desirable wages, is not delivering the right message to potential seafarers. “The shipping industry has quite good initiatives on a micro level, but there’s no good movement to attract people on a macro level,” explains Gerhard.

In addition to the looming deficit, training of crew remains under par in some areas, especially with regards to e-navigational aids. While the new technology should in theory make the industry safer, the human interface is proving to be the weak point. This, say AGCS experts, can partly be blamed on piecemeal training standards. “Training has previously been on generic models of navigation equipment, but now owners are moving towards specific training. This will go a long way towards improving safety,” explains Khanna. “But we still have

different standards for equipment when we need standardization.” The responsibility for this rests with the IMO who should, say AGCS, take the lead in unifying training standards for electronic navigational equipment. “E-navigation,” as Kinsey points out, “is not a standalone system nor a panacea; it’s a tool.”

There are also concerns about the declining experience of onshore technical staff. “Seafarers today come ashore much earlier than they used to so the level of experience is less,” says Khanna. “With rapid changes in technology onboard staff onshore can quickly lose touch with what’s onboard ships. There needs to be some sort of bridge or mechanism to keep the onshore staff in better touch with what’s onboard. Reducing human error onboard is key, but improving decision making onshore is also vital.”

ⁱ <http://www.imo.org/en/MediaCentre/MeetingSummaries/HTW/Pages/HTW-2nd-session.aspx>

ⁱⁱ <http://www.drewry.co.uk/news.php?id=375>

The return of Iran: Safety standards in the spotlight

The re-emergence of Iran on the global shipping and commodities scene is set to shake things up as it seeks to put its stamp on the oil markets. As of mid-January 2016, the country had met all of its requirements under its nuclear deal with world powers to gain relief from international sanctions. Iran has proven oil reserves of 157.5bn barrelsⁱ.

Once it is able to reinvigorate its ageing oil production infrastructure, it will be keen to turn on the taps and supply oil to global market. This excess oil will likely not be welcomed by a market that is already oversupplied and there are additional safety considerations to be taken into account.

“Everyone agrees that the steps taken so far with regards to Iran are good; everyone hopes that the lifting of sanctions can only be positive for world peace and for the people of Iran,” says Gerhard. “But we do need to consider the safety standards onboard Iranian ships re-entering trade and insurers must look very carefully

at this. We also need more transparency of navigational standards in Iranian waters, and port standards need to be brought back to an international level. Sailing to Iran’s ports must be as safe and as transparent as any other in the region.”



The return of Iran on the global shipping stage after its absence in the wake of sanctions raises a number of potential safety issues.

Photo: Shutterstock

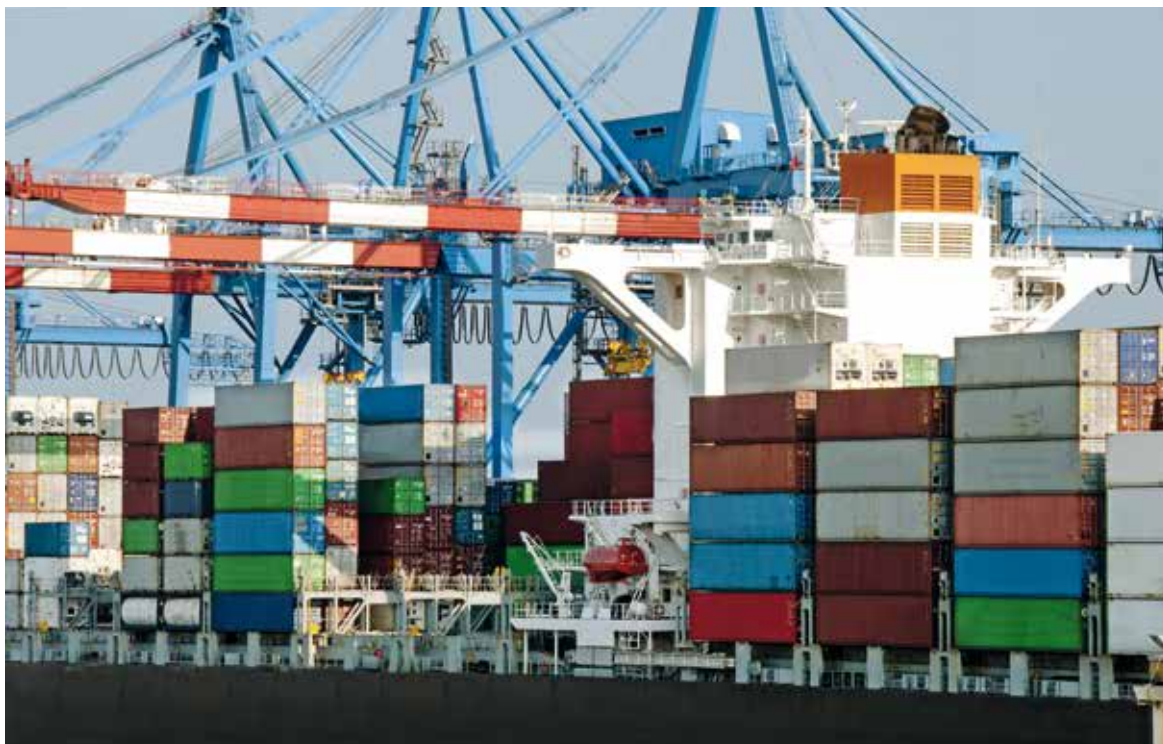
Condition-based maintenance: Benefits and concerns

There is rising interest in a maintenance strategy that promises to spot upcoming equipment failures so maintenance can be proactively scheduled when it is needed. As a process, **condition-based maintenance (CBM)** monitors the actual condition of an asset to decide what maintenance needs to be done. That maintenance only needs to be performed when certain indicators show signs of decreasing performance or upcoming failure. This contrasts with traditional planned scheduled maintenance, where maintenance is performed based upon predefined scheduled intervals. The upside of this process is that the time between maintenance repairs can be extended as it is only done on an as-needed basis.

But while this process can offer significant cost savings for ship operators, owners should be aware that employing condition-based maintenance can place undue pressure on crews that could be suffering from fatigue or inadequate training. This is akin to “allowing the crew to put band aids on the ship”, says Kinsey, which could lead to serious safety consequences in the future.

“The disadvantage of CBM is that the machinery in question needs to be monitored very accurately. If not, we run the risk of a potential fault going undetected and resulting in a major breakdown, especially in case of fatigue and uniform wear failures,” adds Khanna.

ⁱ <https://www.eia.gov/beta/international/country.cfm?iso=IRN>



A large part of the industry appears to be far from being ready to comply with new container weighing regulations.

Photo: Shutterstock

Readiness for container weighing regulations

It has long been recognized that the weights of containers have been routinely mis- or under-declared and the IMO has been working to improve this fundamental threat to ship stability. Since 2011, the IMO's MSC has been studying measures to prevent the loss of containers, which led to the adoption of an amendment to SOLAS regulation VI/2 requiring the mandatory verification of the gross mass of packed containersⁱ.

The new ruling comes into force in July 1, 2016 and promises to fundamentally improve the stability calculations of ships. After that date, shippers will be responsible for providing the verified weight by stating it in shipping documents and submitting it to the master or their representative, and to the terminal representative sufficiently in advance to be used in the preparation of the ship stowage plan. Additionally, supplying the verified gross mass will be a condition for loading a packed container onto a ship.

However, despite the long lead time, the European Shipper's Council has criticized a lack of international harmonization, stating that only a handful of countries have published national regulations for the weighing of containersⁱⁱ.

Shippers are being caught by surprise by these regulations. "That is shocking," says Khanna. "It's critical that we get this right in 2016. A large part of the industry still seems to be far from being ready to comply with this regulation. We cannot afford to have this important safety improvement remain ineffective due to partial implementation."

ⁱ <http://www.imo.org/en/OurWork/Safety/Cargoes/Containers/Pages/Verification-of-the-gross-mass.aspx>

ⁱⁱ <http://europeanshippers.eu/news/container-weighing-harmonization-still-a-far-cry/>

Allianz Global Corporate & Specialty business scope

Allianz Global Corporate & Specialty (AGCS) is the Allianz Group's dedicated carrier for corporate and specialty insurance business. AGCS provides insurance and risk consultancy across the whole spectrum of specialty, alternative risk transfer and corporate business.

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- Liability
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- Property

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Data & sources

The primary data source for total loss and casualty statistics is Lloyd's List Intelligence Casualty Statistics (data run January 22, 2016). Total losses are defined as actual total losses or constructive total losses recorded for vessels of 100 gross tons or over (excluding for example pleasure craft and smaller vessels), as at the time of the analysis.

Some losses may be unreported at this time, and as a result, losses (especially for the most recent period) can be expected to increase as late loss reports are made. As a result, this report does not provide a comprehensive analysis of all maritime accidents, due to the large number of minor incidents, which do not result in a "total loss" and to some casualties which may not be reported in this database.

This year's study analyzes reported shipping losses on a January 1 to December 31 basis.

All \$ US unless stated.

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